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TM 11-5895-225-15

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, FIELD
AND DEPOT MAINTENANCE MANUAL

PANEL, PATCHING
COMMUNICATION
SB-675/MSC

HEADQUARTERS, DEPARTMENT OF THE ARMY

FEBRUARY 1961

AGO 4566A

WARNING

HIGH VOLTAGE

is used in
this equipment.

DEATH ON CONTACT

may result if safety precautions
are not observed.

EXTREMELY DANGEROUS POTENTIALS

exist in the following units:

Power and Signal Entrance Box	115 volts ac
Power Distribution Panel	115 volts ac
Teletypewriter TT–4A/TG	115 volts ac
Terminal, Telegraph TH–5/TG	560 volts dc
Generator, Ringing, Static TA–248/TT	115 volts ac
Switchboard, Telephone, Manual SB–22/PT	90 volts dc
Test Set TS–140/PCM	115 volts ac
Intercommunication Station LS–147D/FI	270 volts dc

WARNING

VENTILATION IS ESSENTIAL

Panel, Patching, Communication SB–675/MSC must be ventilated at all times when occupied to prevent asphyxiation.

DON'T TAKE CHANCES!

TECHNICAL MANUAL
No. 11-5895-225-15

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *27 February 1961*

PANEL, PATCHING, COMMUNICATION SB-675/MSC

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CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

This manual describes Panel, Patching, Communication SB–675/MSC (par. 5) and covers its installation, operation, theory, and maintenance. It also includes instructions for installing components not provided as part of Shelter, Electrical Equipment S–189/MSC (fig. 15). Except for the shelter and its components, major components of the SB–675/MSC are covered in detail in their respective technical manuals (app. I).

2. Forms and Records

a. Unsatisfactory Equipment Reports. Fill out and forward DA Form 468 (Unsatisfactory Equipment Report) or DD Form 787–1 (Electronic Failure Report—Signal Equipment) to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS–M, Fort Monmouth, N. J., as prescribed in AR 700–38 (for DA Form 468) or in AR 700–39 (for DD Form 787–1).

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700–58.

c. Preventive Maintenance Forms. Prepare preventive maintenance forms for the major components (par. 5) as specified in their respective technical manuals (app. I).

d. Parts List Form. Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manuals 7, 8, or 9) with comments concerning the maintenance allocation chart (app. II) direct to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-M, Fort Monmouth, N. J.

e. Comments on Manual. Forward all other comments concerning this manual direct to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS–PA2d, Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use
(fig. 1)

Panel, Patching, Communication SB–675/MSC is an air- or vehicular-transportable assemblage (figs. 6, 7, and 15) used to provide circuit control facilities in an area-type communications system. It provides facilities for the connection of thirty-six 26-pair cable circuits and 24 field wire pairs as well as for the patching, testing, and monitoring telephone circuits, voice-frequency (vf) and direct-current (dc) teletypewriter circuits and intersignal center circuits (telephone and intercom). An alternating current (ac) power source is not provided with the SB–675/MSC. Ac power may be obtained from an adjacent shelter, commercial power facilities, or a central power source (such as Trailer- or Truck-Mounted Diesel Engine Generator Set PU–407/M or PU–408/M) may be used.

4. Technical Characteristics

Power requirements	115-volt, 60-cps, single-phase, 3-wire.
Power consumption (maximum):	
Shelter, Electrical Equipment S–189/MSC:	
Lights	180 watts.
Exhaust blowers	300 watts.
Electric heaters	3,000 watts.
Intercommunication Station LS–147D/FI.	32 watts.
Teletypewriter TT–4A/TG.	160 watts.
Telegraph Terminal TH–5/TG.	460 watts.
Test Set TS–140/PCM.	100 watts.
Total	3,832 watts.
Local communication facilities:	
Telephone circuit	TA–312/PT.
Intercommunication circuit.	LS–147D/FI.
Switchboard circuits (12).	SB–22/PT.

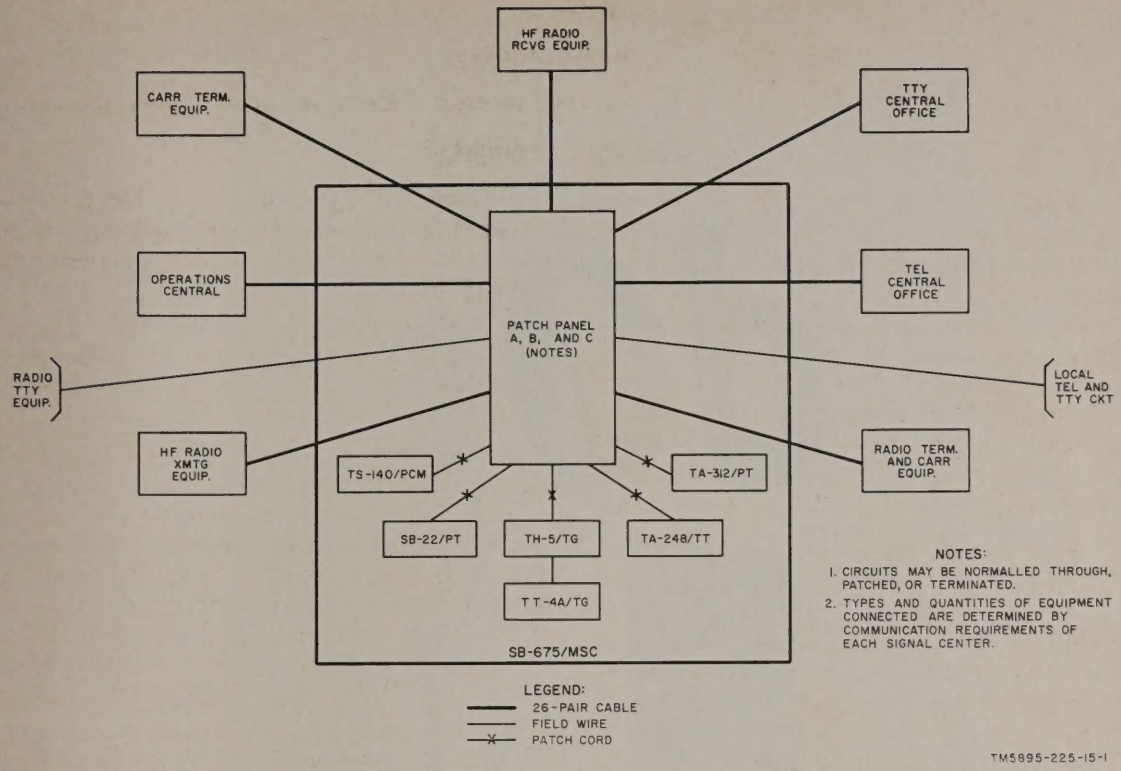

Figure 1. Panel, Patching, Communication SB–675/MSC, as used in typical signal area configuration.

Weight:
- SB–675/MSC ---------- 2,644 lb.
- S–189/MSC ---------- 1,200 lb.

Dimensions (outside):
- Length ---------- 138 in.
- Width ---------- 80 in.
- Height ---------- 77½ in.

5. Major Components of Panel, Patching, Communication SB–675/MSC

Quantity (ea)	Item	Figure No.	Location
1	Shelter, Electrical Equipment S–189/MSC (para 6)	15	
1	Switchboard, Telephone, Manual SB–22/PT	11	
3	Telephone Set TA–312/PT	10	One located in storage drawer.
1	Teletypewriter TT–4A/TG	10	
1	Terminal Box TA–125/GT	11	Mounted underneath front table.
1	Terminal, Telegraph TH–5/TG	10	
1	Test Set TS–140/PCM consisting of:		
	Signal Generator SG–15A/PCM	11	
	Decibel Meter ME–22A/PCM	11	

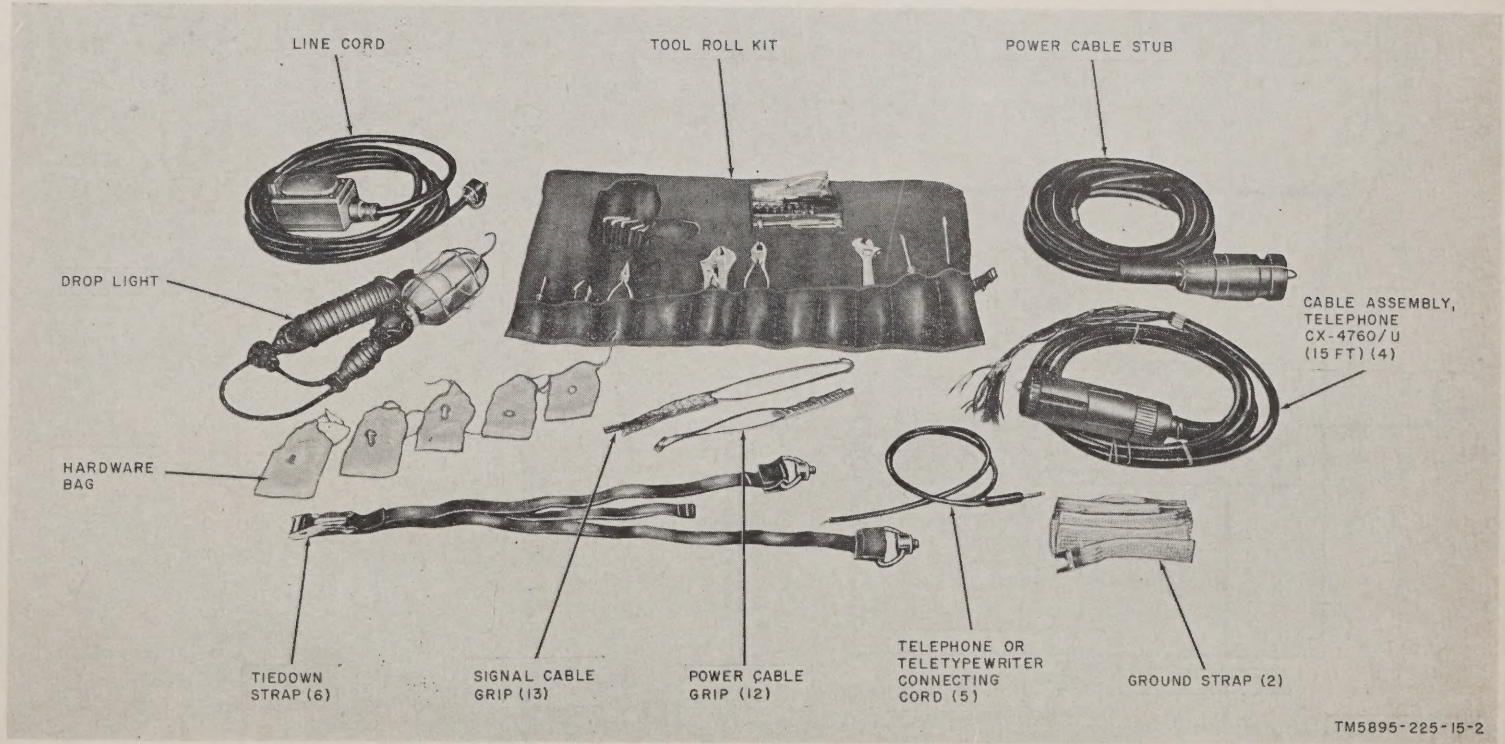

Figure 2. Shelter, Electrical Equipment, S–189/MSC, tools and accessories.

6. Components of Shelter, Electrical Equipment S–189/MSC

Quantity (ea)	Item	Figure No.
1	Axe	12
1	Blackout curtain assembly	12
1	Cable Assembly, Telephone CX–4566/G (250 ft) with Reel RC–435 U.	4
4	Cable Assembly, Telephone CX–4566/G (25 ft).	
4	Cable Assembly, Telephone CX–4760/U (15 ft).	2
3	Distribution Box J–2317/U	8
4	Distribution Box J–1077A/U	9, 10
1	Clock (3 in.)	11
1	Drain plug wrench	12
1	Droplight (25-ft)	2
2	Electric heater	9, 10
1	Fire extinguisher (2½ lb)	12
1	Fire extinguisher (5-lb)	12
1	First aid kit	9
9	Fluorescent lamp, 20 w (24 in.)	5, 14
9	Fluorescent lamp starter FS–2	5, 14
1	Folding chair with cushion	8
5	Grease pencil (5 individual colors)	
1	Generator, Ringing, Static TA–248/TT	11, 22
2	Ground rod	12
2	Ground strap	2
5	Hardware components bag	2
1	Hand brush	12
1	Hand lantern	12, 42
1	Hardset-Headset H–144/U	
16	Hybrid transformers	11
1	Intercommunication Station LS–147D/FI (less case).	11, 22
1	Ladder assembly	8
1	Line cord with duplex receptacle (15 ft)	2
5	Patch cord, 2-wire, black (2-ft)	3
5	Patch cord, 2-wire, black (4-ft)	3
3	Patch cord, 2-wire, black (6 ft)	3
3	Patch cord, 4-wire, black (2-ft)	3
3	Patch cord, 4–wire, black (4-ft)	3
15	Patch cord, 2 wire with 5-db pad, black (2-ft).	3
15	Patch cord, 2-wire with 5-db pad, black (4-ft).	3
10	Patch cord, 2-wire with 5-db pad black (6-ft).	3
3	Patch cord, 4-wire with 5-db pad black (2-ft).	3
5	Patch cord, 2-wire, gray (2-ft)	3
5	Patch cord, 2-wire, gray (4-ft)	3
3	Patch cord, 2-wire, gray (6-ft)	3
5	Patch cord, 2-wire, green (2-ft)	3
5	Patch cord, 2-wire, green (4-ft)	3
3	Patch cord, 2-wire, green (6-ft)	3
5	Patch cord, 2-wire, red (2-ft)	3
5	Patch cord, 2-wire, red (4-ft)	3
3	Patch core, 2-wire, red (6-ft)	3
3	Patch cord, 4-wire, red (2-ft)	3
3	Patch cord, 4-wire, red (4-ft)	3
15	Patch cord, 2-wire with 5-db pad, red (2-ft).	3
15	Patch cord, 2-wire with 5-db pad, red (4-ft).	3
10	Patch cord, 2-wire with 5-db pad, red (6-ft).	3
6	Patch cord, 4-wire with 5-db pad red (2-ft).	3
3	Patch cord, 4-wire with 5-db pad red (4-ft).	3
5	Patch cord, 2-wire, white (2-ft)	3
5	Patch cord, 2-wire, white (4-ft)	3
3	Patch cord, 2-wire, white (6-ft)	3
1	Pencil sharpener	10
2	Personnel platform	8
1	Power cable assembly (100 ft) with reel	4
12	Power cable grip	2
1	Power cable stud (15 ft)	2
13	Signal cable grip	2
1	Sledge hammer	12
1	Sledge handle (spare)	12
1	Sling assembly	13, 32
1	Swivel chair	11
2	Telephone cord (3-ft)	2
1	Telephone cord (6-ft)	2
1	Teletypewriter connecting cord, red (6-ft).	2
1	Teletypewriter connecting cord, black (6-ft).	2
6	Tiedown strap	2
1	Tool roll kit consisting of:	2
	Adjustable wrench, 8-in.	
	Allen wrench set	
	Knife TL–29	
	Lineman's pliers	
	Long-nosed pliers	
	Screwdriver, 2-in.	
	Screwdriver, 4-in.	
	Screwdriver, 6-in.	
	Socker wrench set	
	Vise-grip pliers, 7-in.	
1	Tube pin straightener	7
1	Tube puller, seven-pin	7
1	Tube puller, nine-pin	7
1	VOLT-OHM METER	10, 28
1	Wastebasket	9
1 set	Running spares consisting of:	
	2 fluorescent lamps, 20 w (24 in.)	5, 14
	6 fluorescent lamp starters FS–2	5, 14
	3 glowlamps	5
	1 incandescent lamp, 50-w	5
	1 Neon lamp NE–34	5
1 set	Technical manuals for the major components (par. 5).	

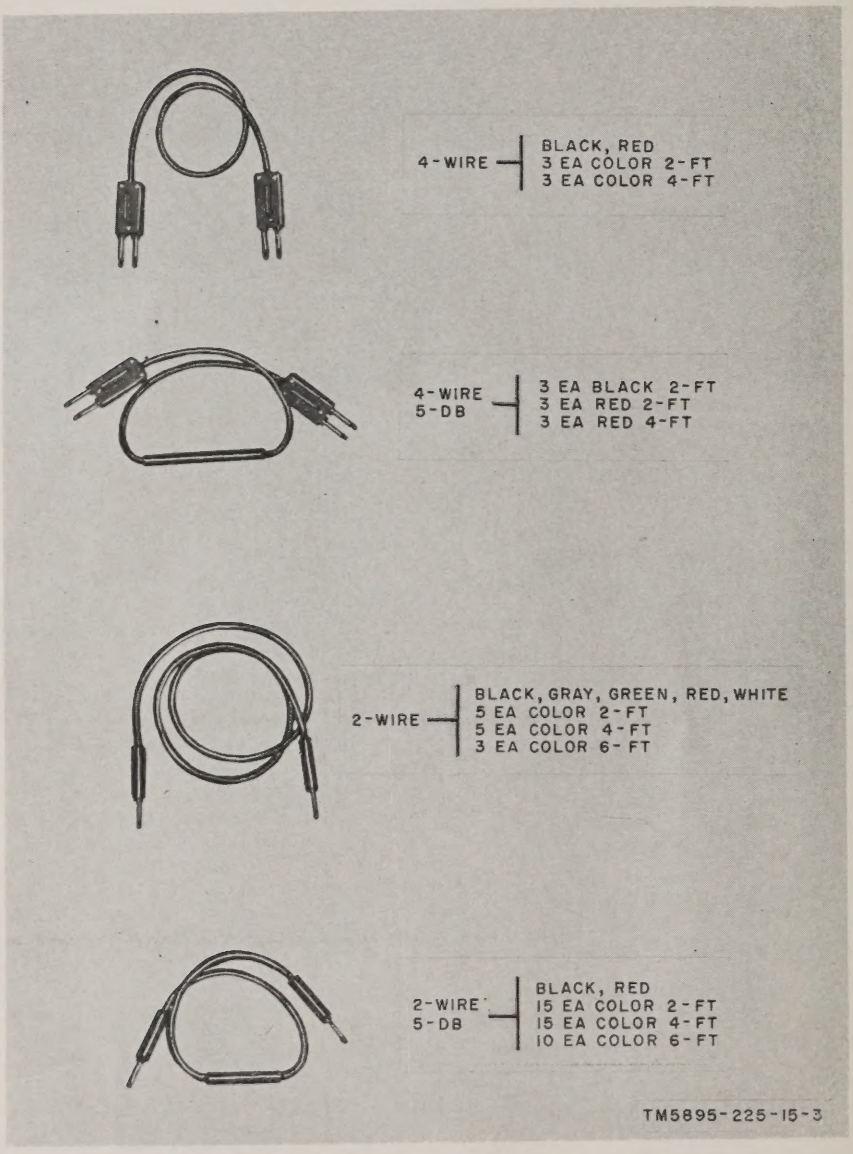

Figure 3. Shelter, Electrical Equipment S-189/MSC, patch cords.

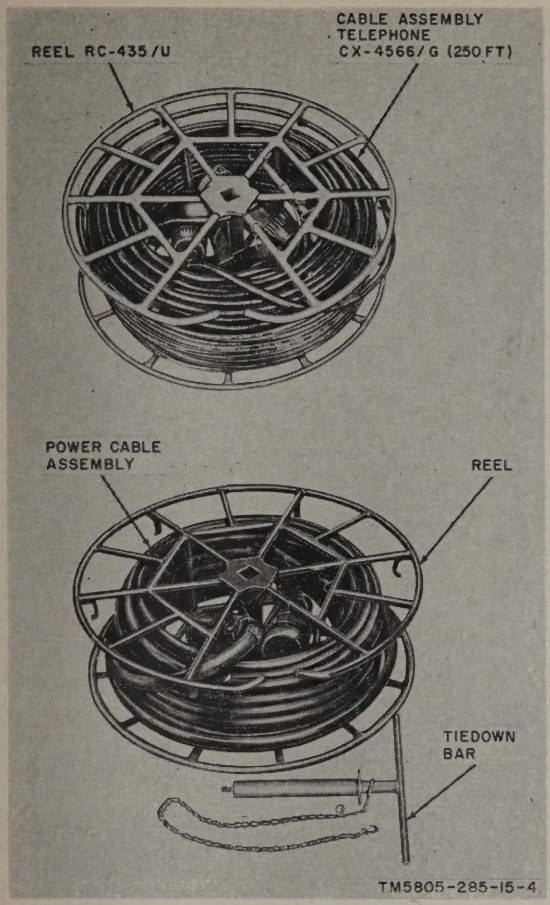

Figure 4. Shelter, Electrical Equipment S–189/MSC, cable assemblies and reels.

7. Common Names

The following is a list of components to which common names have been assigned:

Component	Common name
Cable Assembly, Telephone CX–4760/U (15 ft).	26-pair cable stub.
Cable Assembly, Telephone CX–4566/G (250 ft)	26-pair cable.
or	
Cable Assembly, Telephone CX-4566/G (25 ft).	26-pair patching cable.
Connector, Receptacle, Electrical U-187A/G.	26-pair receptacle.
Connector, Plug, Electrical U-185B/G.	26-pair connector.
Shelter, Electrical Equipment S–189/MSC.	Shelter.

8. Description of Panel, Patching, Communication SB–675/MSC

The components of the SB–675/MSC (par. 5) are housed in Shelter, Electrical Equipment S–189/MSC (par. 6). Major components are described in paragraph 9; shelter components are described in paragraph 10. The shelter entrance boxes (fig. 15) are provided with receptacles and binding posts for making external cable and field wire connections. Figures 6, 7, and 8 are interior views of the SB–675/MSC; the locations of interior components are shown in figures 9 through 14.

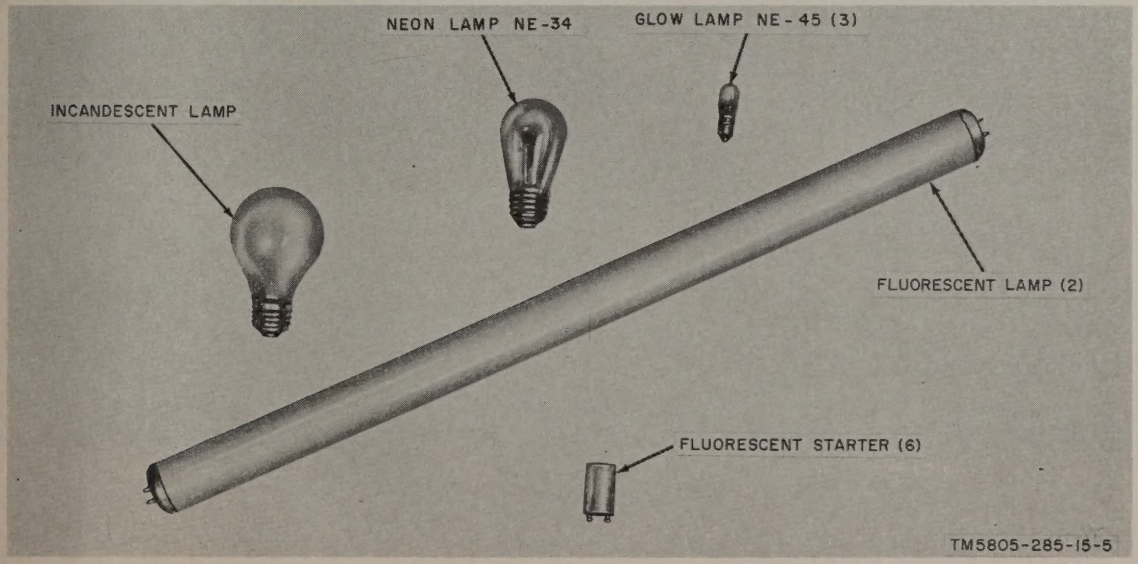

Figure 5. Shelter, Electrical Equipment S–189/MSC, running spares.

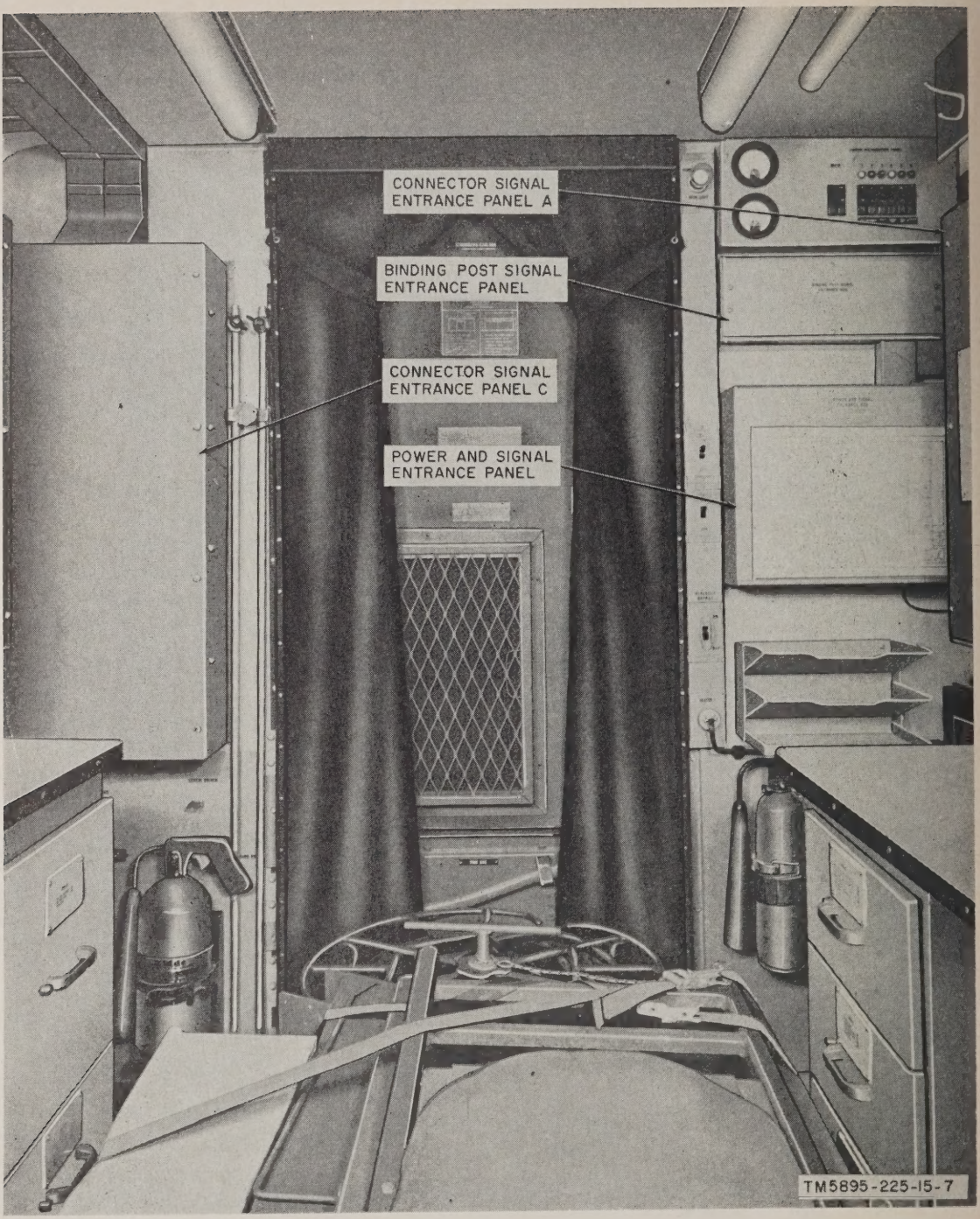
CONNECTOR SIGNAL ENTRANCE PANEL A
BINDING POST SIGNAL ENTRANCE PANEL
CONNECTOR SIGNAL ENTRANCE PANEL C
POWER AND SIGNAL ENTRANCE PANEL
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Figure 6. Panel, Patching, Communication SB-675/MSC, interior rear view.

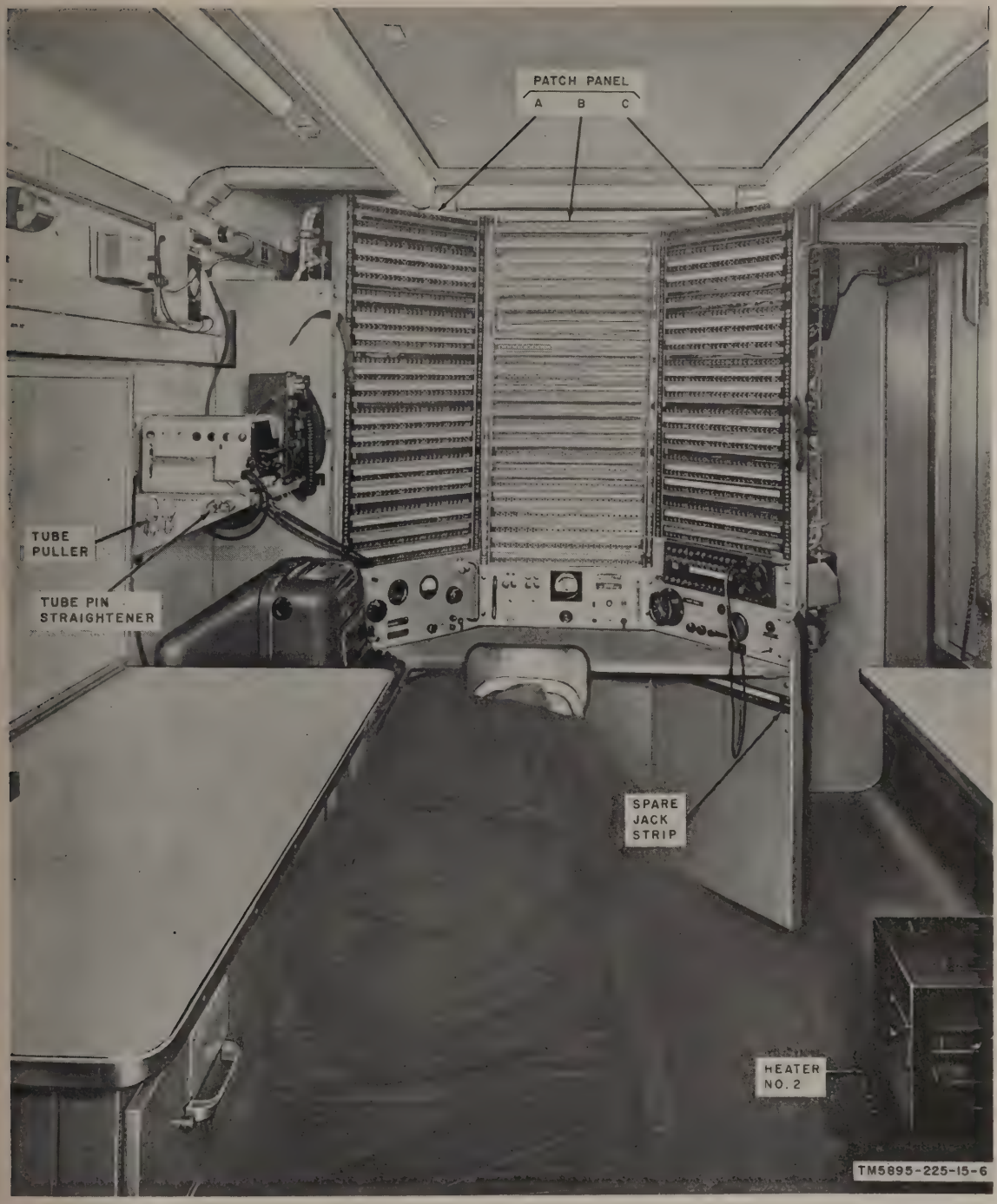

Figure 7. Panel, Patching, Communication SB-675/MSC, interior front view.

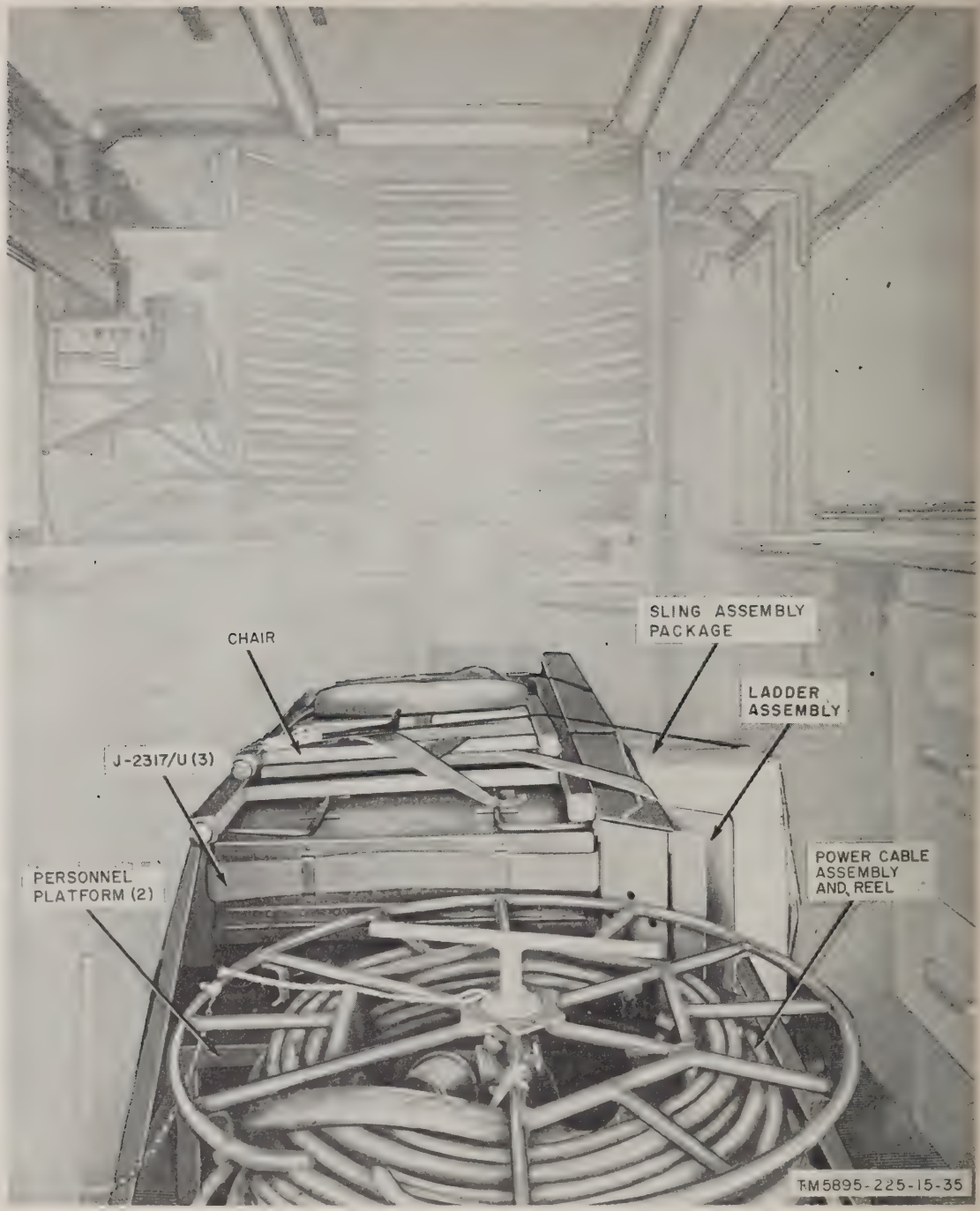

Figure 8. Panel, Patching, Communication SB–675/MSC, components stored in aisle.

Figure 9. Panel, Patching, Communication SB–675/MSC, curbside wall, elevation diagram.
(Located in back of manual)

Figure 10. Panel, Patching, Communication SB–675/MSC, roadside wall, elevation diagram.
(Located in back of manual)

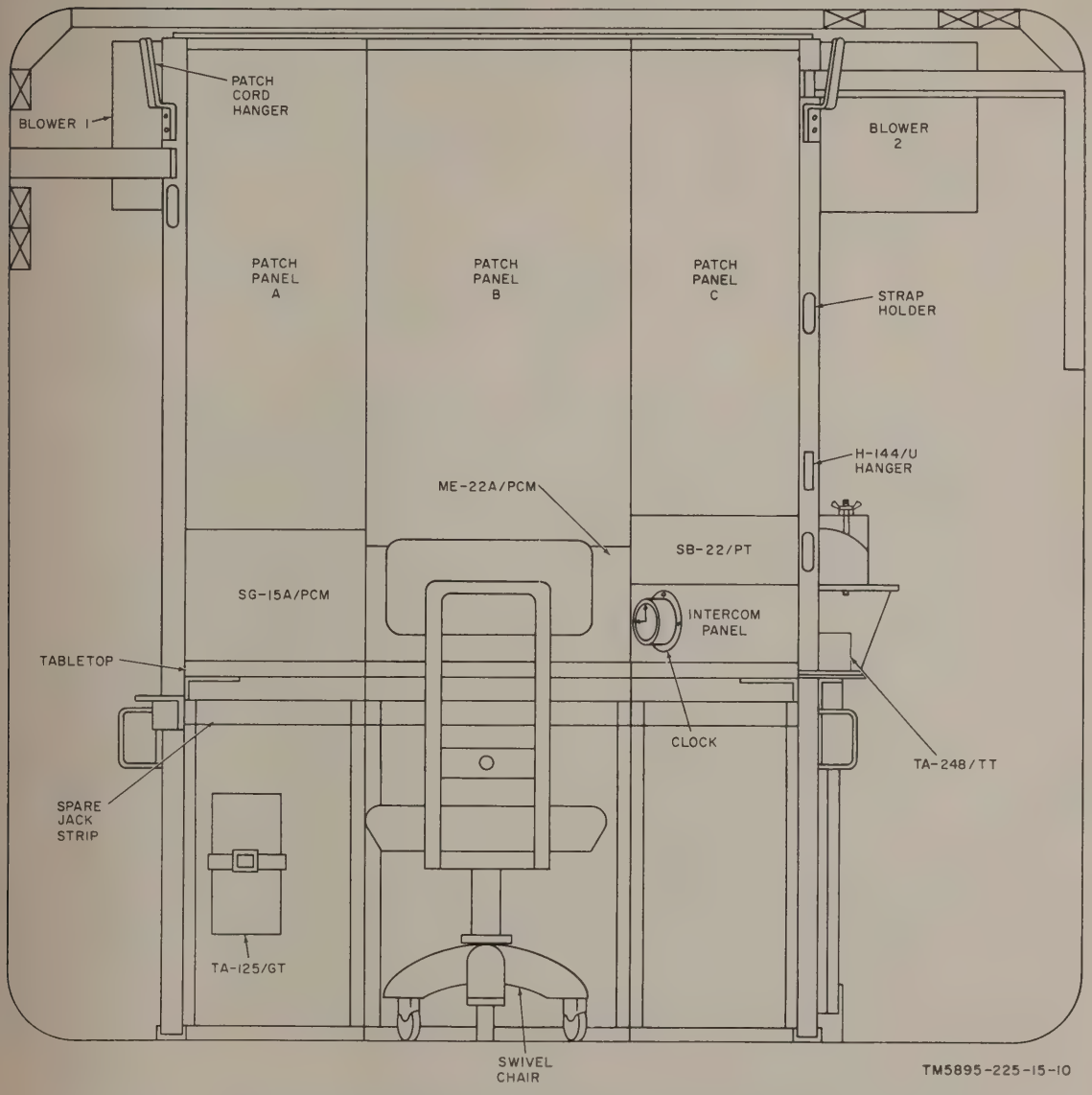

Figure 11. Panel, Patching, Communication SB–675/MSC, front wall, elevation diagram.

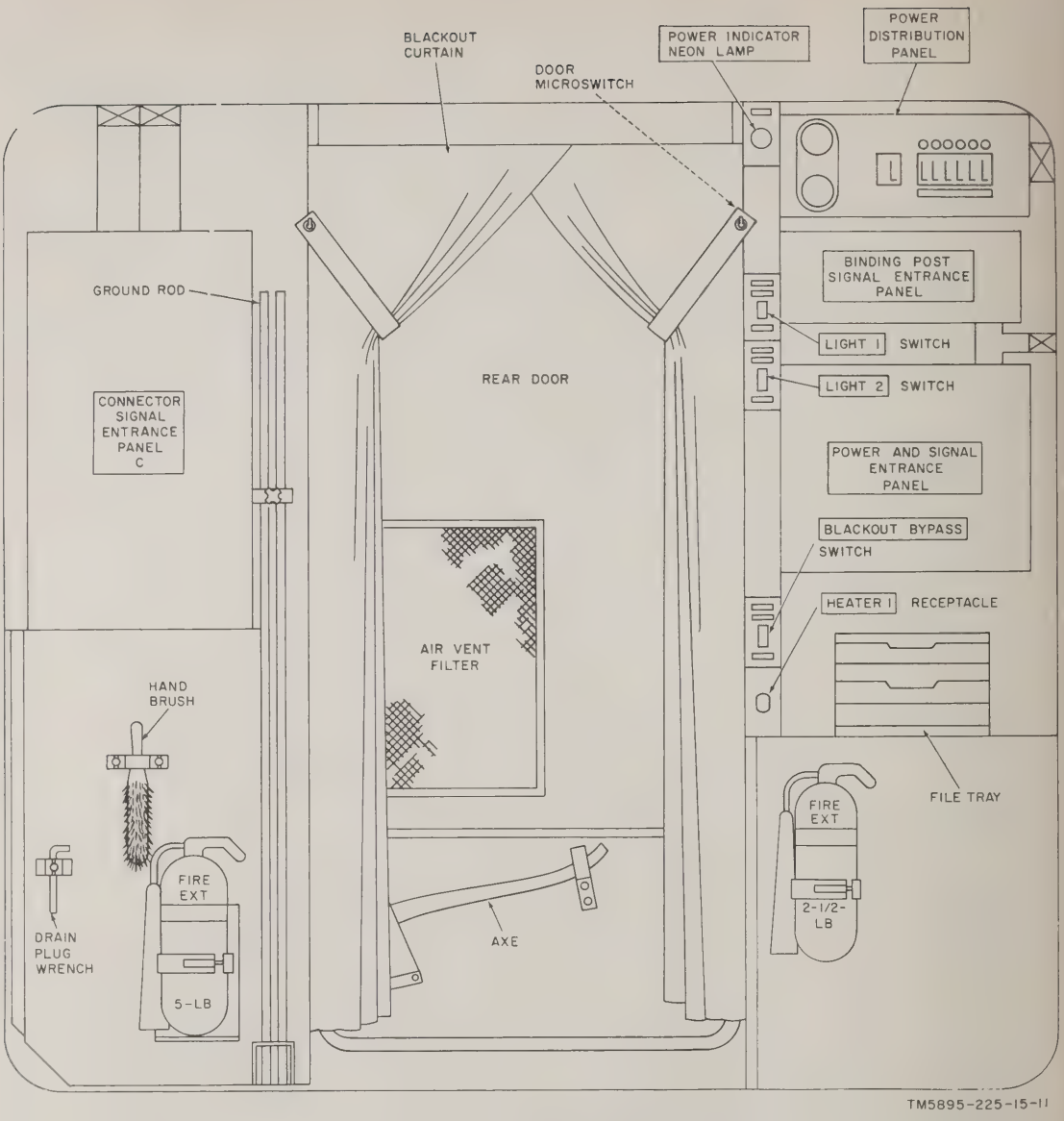

Figure 12. Panel, Patching, Communication SB–675/MSC, rear wall, elevation diagram.

Figure 13. Panel, Patching, Communication SB–675/MSC, floor plan.
(Located in back of manual)

Figure 14. Panel, Patching, Communication SB–675/MSC, ceiling plan.
(Located in back of manual)

9. Description of Major Components of SB–675/MSC

a. Shelter, Electrical Equipment S–189/MSC (fig. 15). The S–189/MSC is an electrical equipment shelter modified to accomodate the equipments that comprise an SB–675/MSC (pars. 5 and 6). The shelter can be transported by helicopter or truck and is fully insulated, watertight, and airtight. Two exhaust blower vents with hinged covers (not shown) are located on the outside front wall. The top half of a two-section door at the rear of the shelter, permits entrance when the shelter is truck-mounted and the tailgate is up.

(1) *Lighting.* Nine 20-watt fluorescent lamps are provided for shelter lighting (fig. 14).

(2) *Power and wiring.* Watertight receptacles in the power and signal entrance box ((3) below) are provided for connecting the shelter to an ac power source. The ac power is routed through switch-type circuit breakers in the power distribution panel ((6) below) to the power duct receptacles (figs. 9, 10, and 12). Signal connections are made at the 26-pair receptacles in the connector signal entrance boxes or at the binding posts in the binding post signal entrance box ((4) below).

(3) *Power and signal entrance box* (fig. 16). The power and signal entrance box on the exterior of the rear wall (fig. 15) contains power receptacles for connecting power cables and binding posts for terminating circuits of telephone set TA–312/PT and intercommunication station LS–147D/FI. The power and signal entrance box cover is equipped with folding side panels for weather protection and is secured with captive-screw type fasteners.

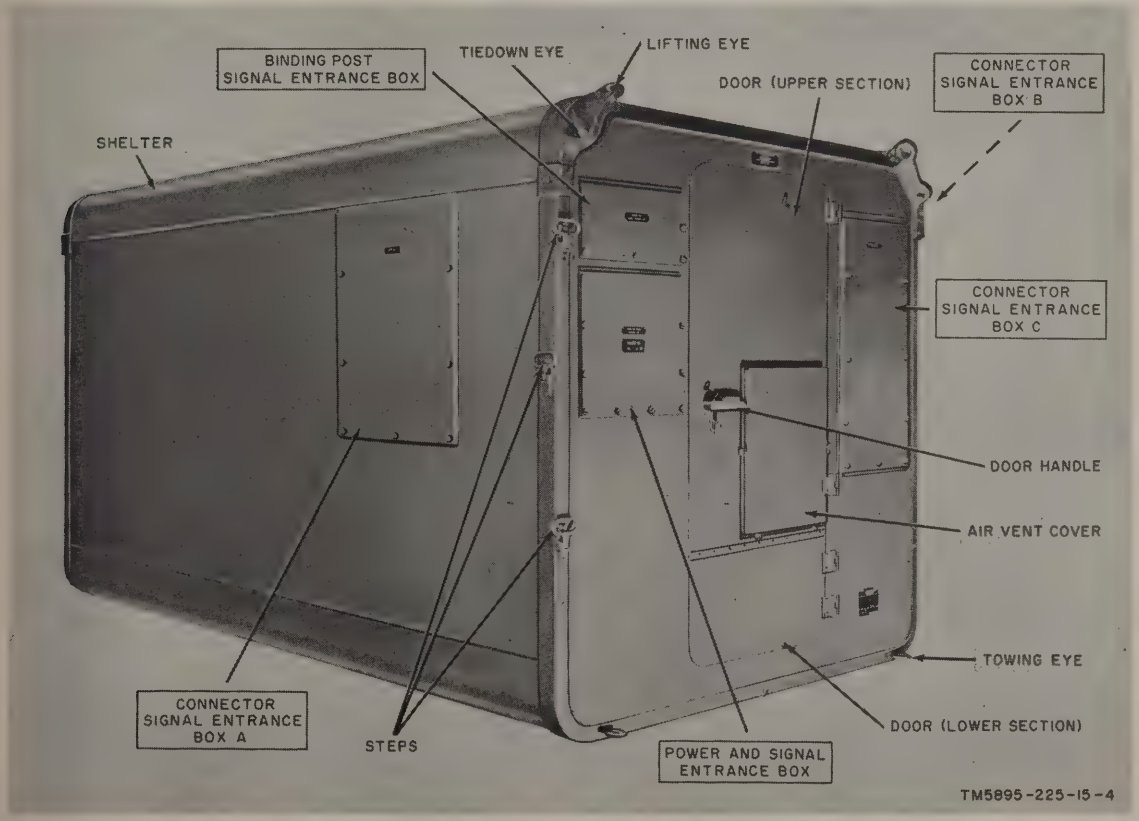

Figure 15. Shelter, Electrical Equipment S–189/MSC.

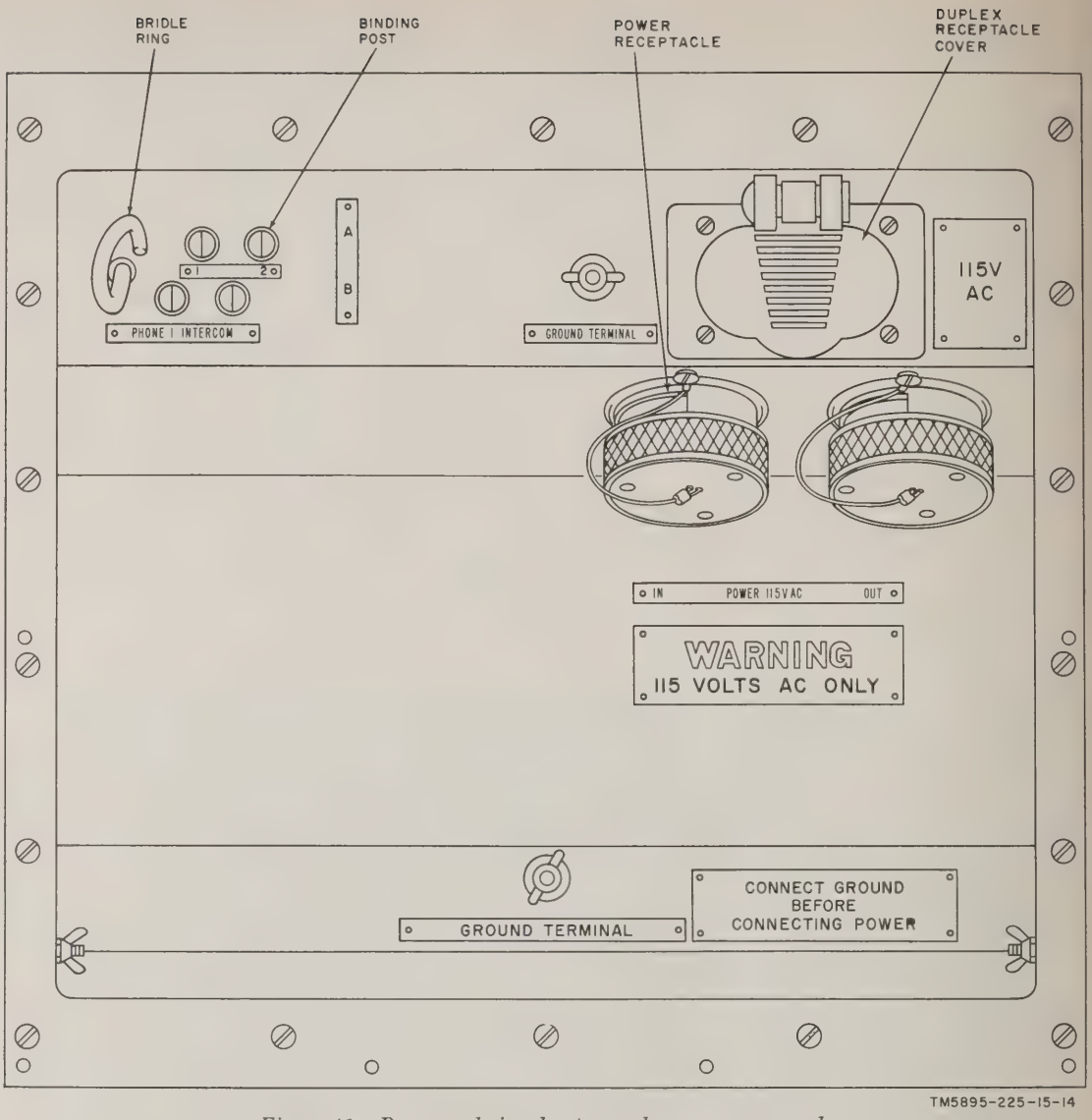

Figure 16. Power and signal entrance box, cover removed.

(4) *Binding post signal entrance box* (fig. 17). The binding post signal entrance box on the exterior rear wall (fig. 15) contains 24 pairs of binding posts; 12 pairs of binding posts are wired to the SB–22/PT (*c* below) and the other 12 pairs are wired to the EXTERNAL WIRE LINES jacks on patch panel A (par. 10*e*). The binding post signal entrance box cover is equipped with folding side panels for weather protection and is secured with captive-screw type fasteners.

(5) *Connector signal entrance boxes* (figs. 18 and 19). The three connector signal entrance boxes (A, B, and C) on the exterior of the shelter (fig. 15) each contain twelve 26-pair cable receptacles. The connector signal entrance box covers are equipped with folding side panels for weather protec-

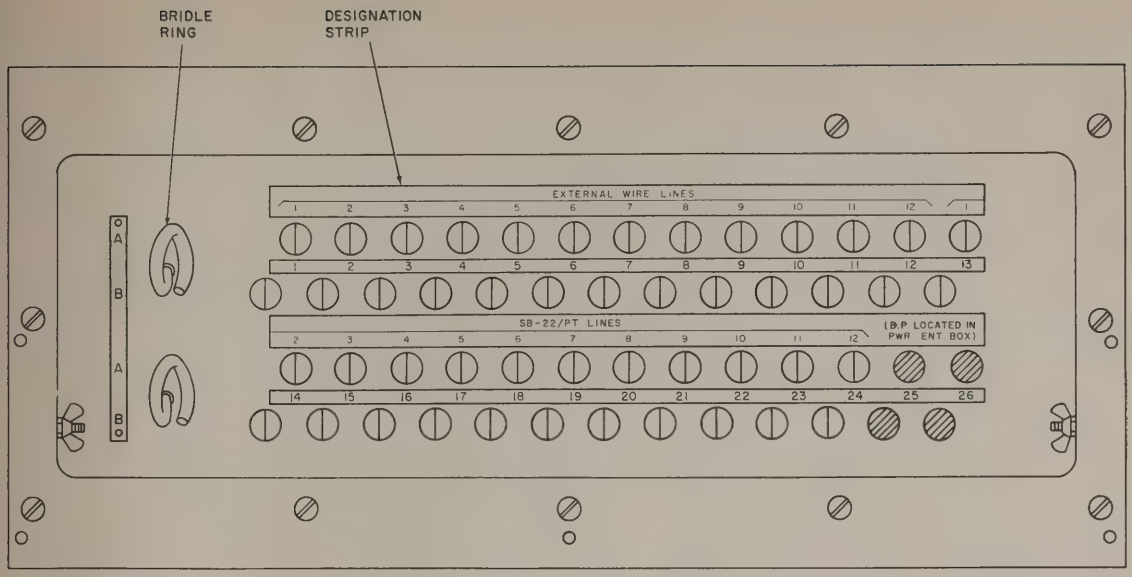

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Figure 17. Binding post signal entrance box, cover removed.

tion and are secured with captive-screw type fasteners.

(6) *Power distribution panel* (fig. 20). The power distribution panel is located on the rear wall of the shelter (fig. 12). Glowlamps, associated with each of six *branch* circuit breakers, light when these circuit breakers are in their ON position.

(7) *Connector, power, and binding post signal entrance panels.* The connector signal entrance panels (A, B, and C), the binding post signal entrance panel, and the power and signal entrance panel are mounted on the interior walls (figs. 9, 10, and 12). Each entrance panel is equipped with a removable cover that provides access to the rear of the receptacles or binding posts mounted in the respective entrance boxes (fig. 15).

b. Switchboard, Manual, Telephone SB–22/PT. The SB–22/PT (TM 11–2202) is mounted above the intercom panel (fig. 11). It is a local battery switchboard with facilities for switching up to 12 telephone or vf teletypewriter circuits.

c. Terminal, Telegraph TH–5/TG. The TH–5/TG (TM 11–5805–246–10) permits the TT–4A/TG to be used over vf circuits and is connected to the patch panel through the 2W–4W switch (par. 10*g*). It is mounted on a shelf located on the roadside wall (fig. 10).

d. Telephone Set TA–312/PT. Two TA–312/PT's (TM 11–2155) are mounted (less carrying cases) on the roadside wall (fig. 10); a third TA–312/PT is located in a storage drawer. The TA–312/PT's are arranged for local-battery operation and are used for local telephone communication.

e. Teletypewriter TT–4A/TG. The TT–4A/TG (TM 11–5815–206–12) is mounted on the roadside tabletop (fig. 10) and is used in the SB–675/MSC for monitoring and testing teletypewriter circuits.

f. Terminal Box TA–125/GT. The TA–125/GT (TM 11-2138) is located under the tabletop below patch panel A (fig. 11). It is a 24-pair terminal box used to interconnect field wire circuits during testing, patching, and monitoring procedures.

g. Test Set TS–140/PCM. Components of the TS–140/PCM (TM 11–2096) are Signal generator SG–15A/PCM and decibel meter

Figure 18. Connector signal entrance box A, cover removed.
(Located in back of manual)

Figure 19. Connector signal entrance box C, cover removed.
(Located in back of manual)

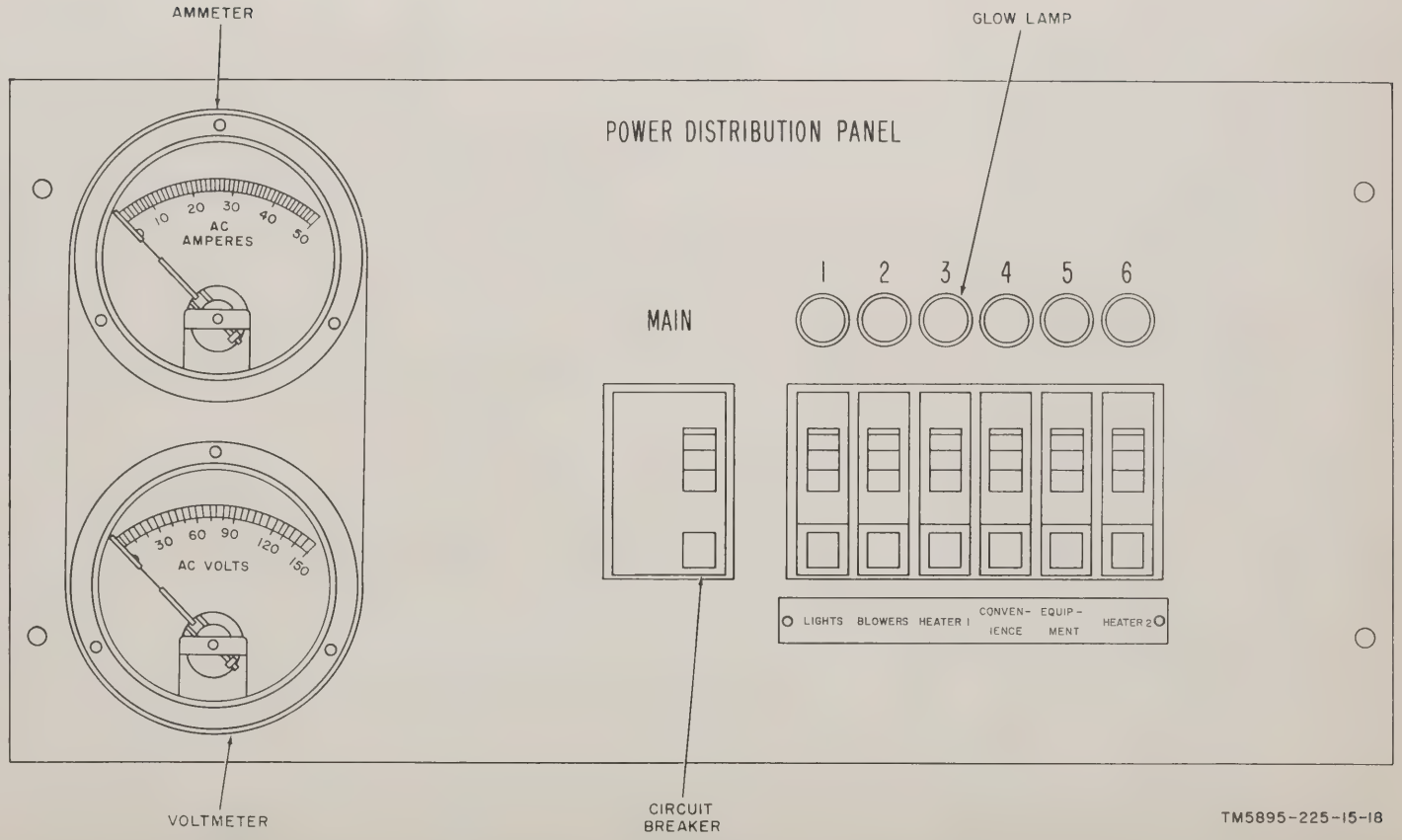


Figure 20. Power distribution panel.

ME–22A/PCM. The SG–15A/PCM, mounted below patch panel A (fig. 11), supplies the signals required for testing the signal circuits connected to the SB–675/MSC; the ME–22A/PCM, mounted below patch panel B, measures the loss or noise level of the SB–675/MSC signal circuits.

10. Description of S–189/MSC Components

a. Electric Heaters (fig. 21). Two electric heaters, secured in their mounting bases, are provided with the S–189/MSC (figs. 9 and 10). Each heater contains a heating element and a fan for air circulation. Horizontal louvers on the front of the heaters are adjustable to deflect the airstream. Operating controls are located on the top of each heater; the power cord extends through a hole in the right side of each back cover plate.

b. Intercommunication Station LS–147D/FI (fig. 22). The LS–147D/FI (less its case) is mounted in the intercom panel (fig. 11). It provides two-way nonprivate communication in a system consisting of other LS–147D/FI's or equivalent equipments.

c. Exhaust Blowers. The exhaust blowers on the front wall (fig. 11) are equipped with removable covers that muffle the sound when the blowers are turned on. Lighttight vents, equipped with hinged covers and rain shields, provide exhaust access to the outside of the shelter.

d. Clock. An 8-day, luminous-dial, 24-hour clock is mounted on the intercom panel (fig. 22). A knob on the left-hand side is used for winding and setting the clock.

e. Patch Panel (figs. 23, 24, and 25). Three patch panels designated A, B, and C are mounted near the front wall of the shelter (fig. 11). A spare jack strip is located below the tabletop at each bay.

f. TT–4A/TG–TH–5/TG Switchbox (fig. 26). The TT–4A/TG–TH–5/TG switchbox is mounted on a shelf located on the roadside wall (fig. 10). It controls ac power to the TT–4A/TG and TH–5/TG.

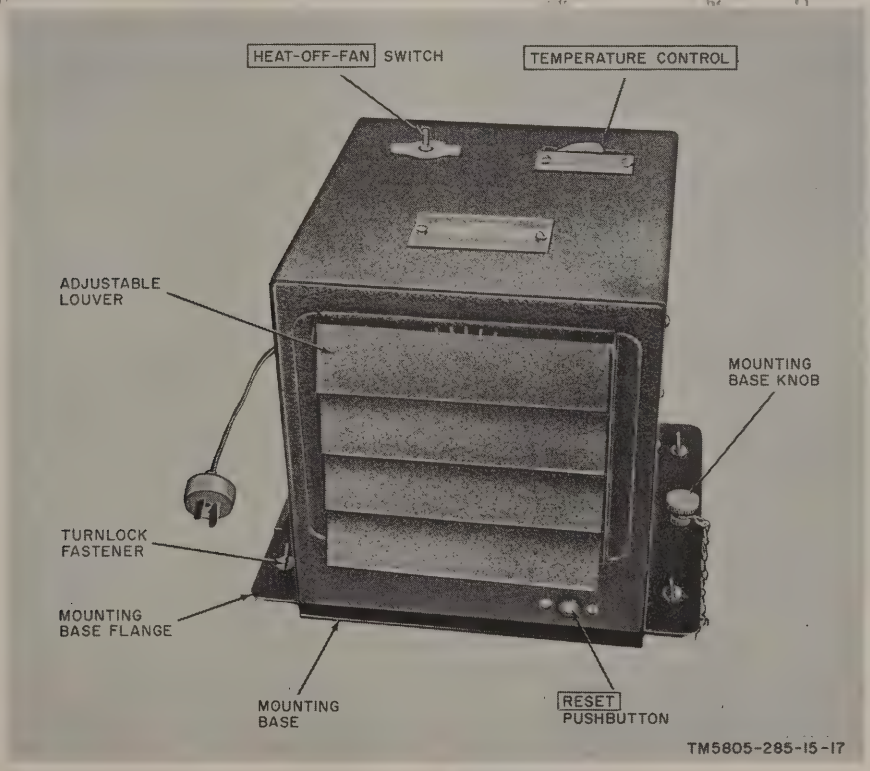


Figure 21. Electric heater.

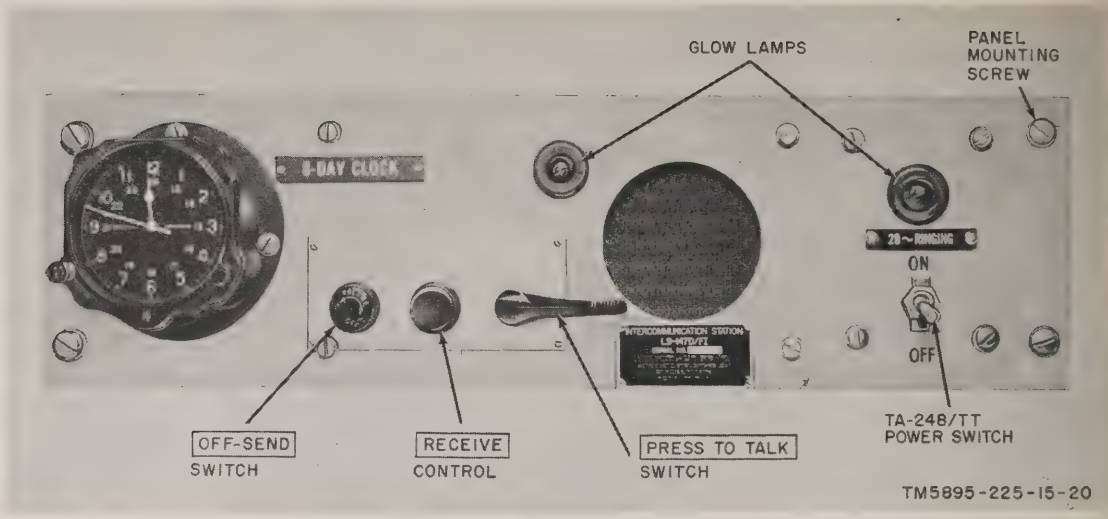


Figure 22. Intercom panel.

Figure 23. Patch panel A.
(Located in back of manual)

Figure 24. Patch panel B.
(Located in back of manual)

Figure 25. Patch panel C.
(Located in back of manual)

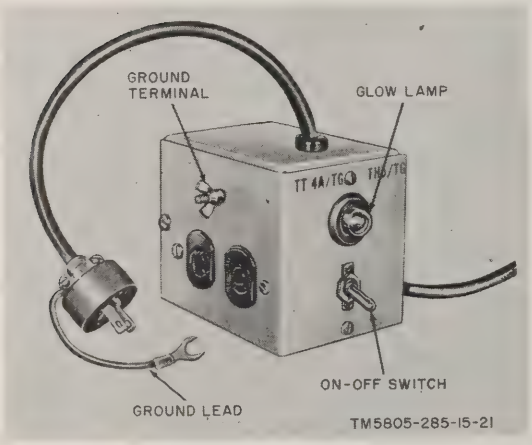


Figure 26. TT–4A/TG–TH–5/TG switchbox.

g. 2W–4W Switch (fig. 27). The 2W–4W switch is secured to the TH–5/TG mounting rack (fig. 10) and is wired to the TH–5/TG with four color-coded conductors and a pair of shielded wires. It arranges the TH–5/TG for two-wire, four-wire, half-duplex operation, or four-wire full-duplex operation and is equipped with cords to facilitate connection to the patch panel.

h. Hybrid Transformers. Sixteen hybrid transformers are installed near the floor behind patch panels A and B. The hybrid transformers terminate in patch panel jacks and are used to patch four-wire circuits to two-wire circuits.

i. Cords and Cables.

(1) *Power cable assembly and reel* (fig. 4). The power cable assembly is wound on a reel and secured with the tiedown bar to the floor at the rear of the shelter (fig. 13). It is a 100-foot, three-conductor cable with a watertight power connector on each end.

(2) *Power cable stub* (fig. 2). The power cable stub is stored in a storage cabinet. It is a 15-foot, three-conductor cable with a watertight power connector on one end and red, white, and black prepared leads on the other end. It is used for connections to the power source (par. 28).

(3) *Cable Assembly, Telephone CX–4566/G (250 ft)* (fig. 4). The 26-pair cable is wound on Reel RC–435/U and secured to the floor of the shelter along with the power cable assembly and reel (fig. 13). It is 250 feet long and is equipped with a 26-pair connector on each end.

(4) *Cable Assembly, Telephone CX–4760/U (15 ft)* (fig. 2). Four 26-pair cable stubs are located in storage drawers.

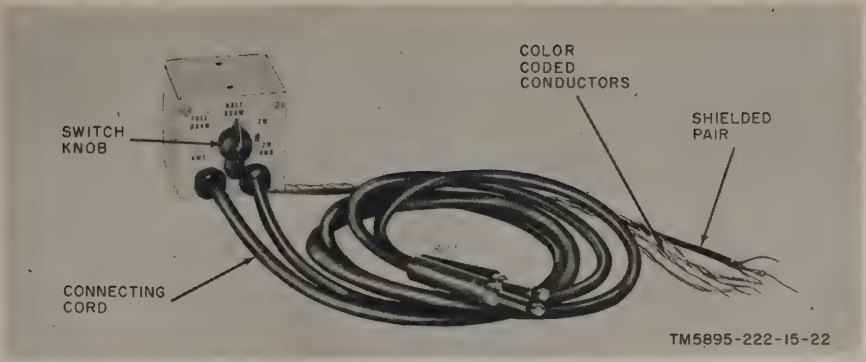


Figure 27. 2W–4W switch.

Each 26-pair cable stub is 15 feet long and is equipped with a 26-pair connector on one end and prepared leads on the other end.

(5) *Cable Assembly, Telephone CX–4566/G (25ft).* Four 26-pair patching cables are located in storage drawers. Each 26-pair patching cable is 25 feet long and is equipped with a 26-pair connector on each end. They are provided for use with the J–2317/U (*l* below).

(6) *Patch cords* (fig. 3). The patch cords are stored in storage cabinets near the patch panel. The patch cords are flexible, two-conductor and four-conductor cords equipped with either single or double telephone plugs at each end and are supplied in 2-, 4-, and 6-foot lengths in black, white, green, gray, and red; those with built-in 5-decibel (db) pads are clearly identified.

(7) *Telephone cords* (fig. 2). The telephone cords are flexible, two-conductor cords with a telephone plug on one end and prepared leads on the other. Two 3-foot cords and one 6-foot cord are supplied; two are installed for use with the TA–312/PT's. The third cord is kept in a storage drawer.

(8) *Teletypewriter cords.* Two teletypewriter cords are supplied for use with the TT–4A/TG. They are flexible. two-conductor, 6-foot cords with prepared leads on one end and black or red telephone plugs on the other end. They are clamped to the shelf adjacent to the TT–4A/TG (fig. 10).

j. VOLT-OHM METER (fig. 28). The VOLT-OHM METER and the meter battery box are mounted on the roadside wall (fig. 10). The VOLT-OHM METER is used with the test jacks on patch panel B (fig. 24) to test the dc telegraph line circuits for foreign battery and to test and measure the resistance of the signal line circuits and patch cords.

k. Handset-Headset H–144/U. The H–144/U (TM 11-2155), equipped with an 8-foot cord, provides the operator at the patch panel with a means of communicating over the signal area telephone circuit (TA–312/PT No. 1 or No. 2) while performing patching and testing procedures.

l. Distribution Box J–2317/U. Three J–2317/U's are provided with the shelter and are stored in the center aisle of the shelter (fig. 8). Each J–2317/U contains four 26-pair receptacles and 104 parallel-connected binding posts housed in a weather-resistant box; the cover of the box can be locked in the raised position when making wire and cable connections. The J–2317/U is used as an intermediate distribution frame (IDF) (par. 33).

m. Distribution Box J–1077A/U. Four J–1077A/U's are provided with the shelter and are mounted on the curbside and roadside walls (figs. 9 and 10). Each J–1077A/U contains 26 pairs of binding posts connected in parallel with two 26-pair receptacles which are housed in a weather-resistant box; the cover of the box can be locked in the raised position when making wire and cable connections. The J–1077A/U's can be used to connect field wire to 26-pair cables or to terminate and provide cross-connection facilities for cable circuits if

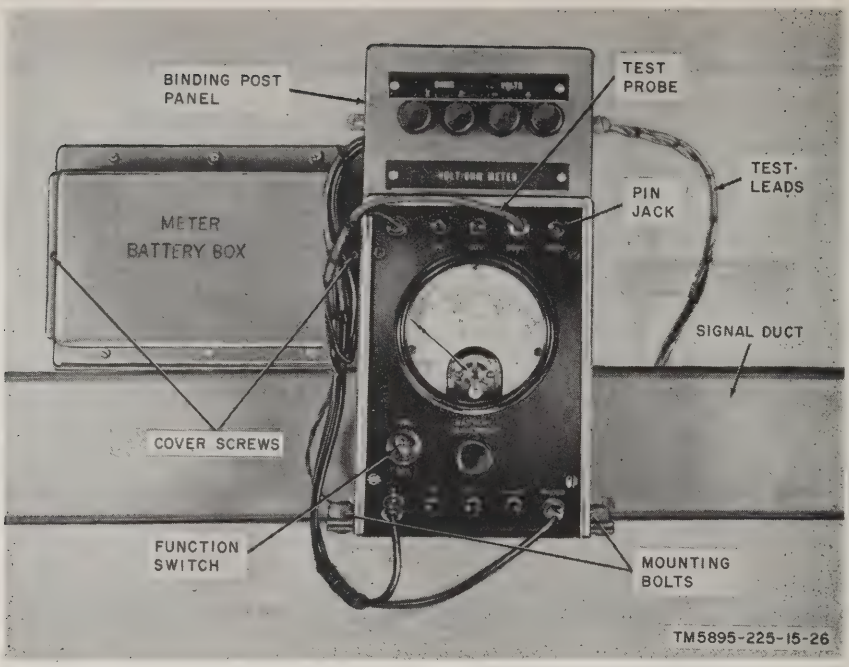


Figure 28. VOLT-OHM METER and meter battery box.

the SB–675/MSC patch panel becomes inadequate or inoperative (par. 36).

n. Generator, Ringing, Static TA–248/TT. The TA–248/TT (TB SIG 203) is mounted at the rear of patch panel C (fig. 11); a power switch and glowlamp for the TA–248/TT are located on the intercom panel (fig. 22). The TA–248/TT is a vibrating-reed type of frequency converter that supplies automatic 20-cycle-per-second (cps) ringing current from a 110-volt, 60-cps, ac source for use at patch panel B and with the SB–22/PT.

CHAPTER 2
INSTALLATION

Section I. INSTALLATION OF EQUIPMENT

11. General

When an SB–675/MSC is received, uncrate and check it (par. 12); then perform the tests in paragraphs 21 through 24. When an S–189/MSC is received, perform the procedures in *a* through *g* below; then perform the procedures in paragraphs 15 through 24.

a. Uncrate and check the equipment (par. 12).

b. Install the SB–22/PT (par. 14*a*).

c. Install the TH–5/TG (par. 14*b*).

d. Install the TT–4A/TG (par. 14*c*).

e. Install the TA–312/PT (par. 14*d*).

f. Install the TS–140/PCM (par. 14*e*).

g. Install the TA–125/GT (par. 14*f*).

Note. The SB–675/MSC must be adequately grounded before the lighting and convenience receptacles can be used.

12. Uncrating and Checking

a. Uncrating Shelter (fig. 29).

(1) Remove the front and rear panels by removing the bolts. Remove the top and side panels by removing the bolts.

(2) Remove the four lag screws that secure the base of the crate to the shelter.

(3) Remove the sling assembly from its package which is located on the floor of the shelter (fig. 8).

(4) Use a device capable of lifting 5,000 pounds to remove the shelter from the base of the crate. Attach the sling assembly cables to the lifting eyes on the top corners of shelter (par. 26) and raise the shelter off the base of the crate.

(5) Remove the base of the crate and lower the shelter.

b. Checking Contents. Check the contents of the SB–675/MSC or the S–189/MSC against the packing list. If the packing list is not available, use the table of components (pars. 5 and 6 for the SB–675/MSC or par. 6 for the S–189/MSC) to check the equipment that *probably* was packed.

13. Tools Required

The tool roll kit (par. 6) is required to install and connect the equipment in the SB–675/MSC.

14. Installation of Major Components

a. Installation of SB–22/PT. Install the SB–22/PT in the rack mounting beneath patch panel C (fig. 11) as described below.

(1) Remove and store cover from the SB–22/PT (TM 11–2202).

(2) Remove the wingnuts from the bolts that secure the retaining bar to the rack mounting behind patch panel C. Raise the retaining bar.

(3) Slide the SB–22/PT into the mounting so that the front of the SB–22/PT is flush with the face of the patch panel.

(4) Place the retaining bar over the SB–22/PT and tighten the wingnuts.

b. Installation of TH–5/TG. Install the TH–5/TG on the roadside shelf (fig. 10) as described below.

(1) Release the snap catches on the case and open the cover assembly.

(2) Use a screwdriver to release the three captive screws on the front panel and remove the chassis from its case. Store the case.

(3) Place the TH–5/TG chassis in its shelter mounting and fasten the three captive screws.

(4) Connect the shielded wire pair from the 2W–4W switch (par. 17).

(5) Remove the spare fuses from inside the cover assembly and place them in a storage drawer.

c. Installation of TT–4A/TG.

(1) Remove and store the immersionproof cover (TM 11–5815–206–12).

(2) Remove four wingnuts which are located under the tabletop (fig. 10) and also remove the two holddown bars.

(3) Position the TT–4A/TG on the tabletop. Place the holddown bars over the lashing hooks on the sides of the TT–

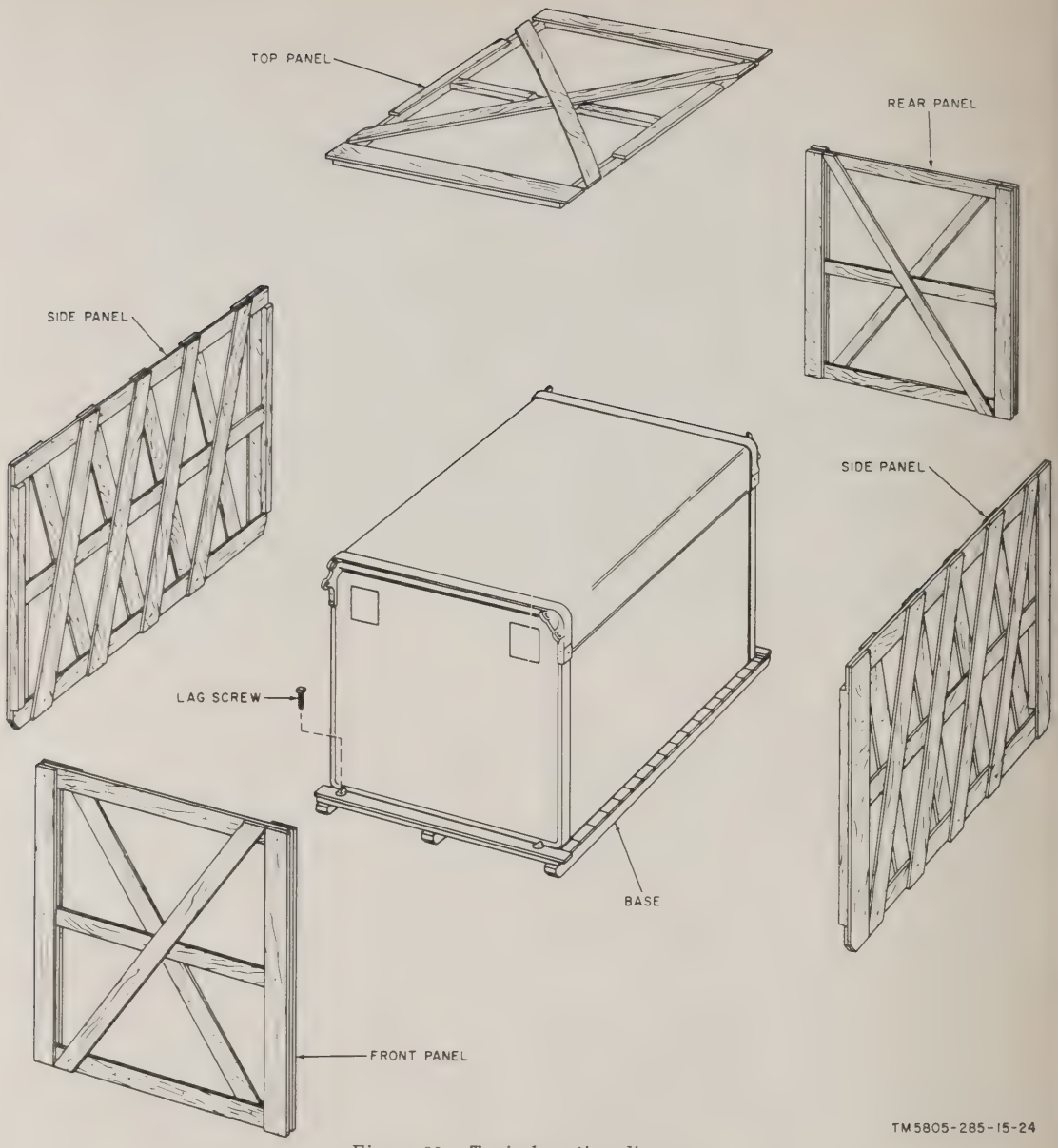


Figure 29. Typical crating diagram.

4A TG base and through the holes in the tabletop.

(4) Replace and tighten the four wingnuts.

(5) Fasten the web strap from each holddown bar over the top of the TT–4A/TG dust cover.

d. Installation of TA–312/PT. Place one TA–312/PT (with carrying case) in a storage drawer. Install two TA–312 PT's (less carrying case) on the roadside wall (fig. 10) as described below.

(1) Loosen the wingnut on the side of the mounting bracket (fig. 30).

(2) Rotate the clamping arm upward and tighten the wingnut to secure the arm in place.

(3) Use a screwdriver to remove the flathead screw and the holding plate (inside the mounting bracket).
(4) Insert the holding plate into the buzzer recess on the side of the TA–312/PT.
(5) Place the TA–312/PT into the mounting bracket and replace the flathead screw.
(6) Insert Batteries BA–30 in the TA–312/PT's and arrange the LB-CB-CBS (TM 11–2155) switch as required.

e. Installation of TS–140/PCM. Install the components of the TS–140/PCM in the racks beneath patch panels A and B (fig. 11) as described below.

(1) Remove the SG–15A/PCM and the ME–22A/PCM from their carrying cases (TM 11–2096). Remove the patching cords and store them until the components are connected (par. 20).
(2) Place the SG–15A/PCM in the rack below patch panel A; place the ME–22A/PCM in the rack below patch panel B. Tighten all mounting screws.

f. Installation of TA–125/GT. Place the TA–125/GT in its mounting bracket below the table top at patch panel A (fig. 11) and secure it with the web straps provided on the mounting bracket.

g. Installation of VOLT-OHM METER Batteries (fig. 28). The VOLT-OHM METER requires three Batteries BA-30 that are not supplied with the S–189/MSC.

(1) Remove the two cover screws from the meter battery box.
(2) Install three BA–30's with the center brass caps *up*.
(3) Replace the meter battery box cover and tighten the screws.

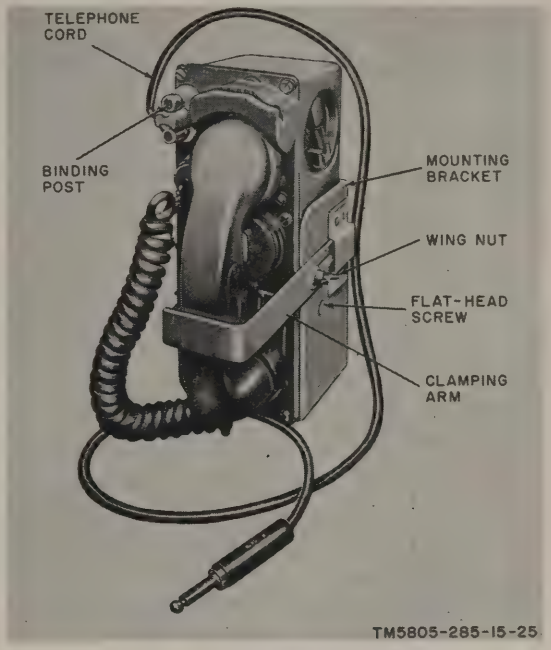


Figure 30. Telephone Set TA–312/PT, installed for transit.

Section II. EQUIPMENT CONNECTIONS

15. General

The signal ducts contain all the wiring required to interconnect the components of the SB–675/MSC. All wiring is appropriately tagged and prepared for connection. The signal schematic-wiring diagram (fig. 55) supplements the information given in paragraphs 16 through 20. The power duct contains receptacles for each piece of equipment that requires ac power. The tools required for interconnection are specified in paragraph 13.

16. Connection of SB–22/PT

a. Connect the prepared leads to the SB–22/PT binding posts according to the chart below.

Wire pair No.	Wire colors	SB–22/PT binding post pair No.
1	WHT-BRN-RED, WHT-GRN-RED	1
2	WHT-BLU-RED, WHT-YEL-RED	2
3	WHT-RED-RED, WHT-GY-RED	3
4	WHT-BLK-ORN, WHT-ORN ORN	4
5	WHT-BRN-ORN, WHT-GRN-ORN	5
6	WHT-BLU-ORN, WHT-YEL-ORN	6
7	WHT-RED-ORN, WHT-GY-ORN	7
8	WHT-BLK-BRN, WHT-ORN BRN	8
9	WHT-BRN-BRN, WHT-GRN BRN	9
10	WHT-BLU-BRN, WHT-YEL-BRN	10
11 (2 pairs)[a]	WHT-RED-BRN, WHT-GY-BRN	11
12 (2 pairs)[a]	WHT-BLK-BLU, WHT-ORN-BLU	12

[a] Two pairs of wires are connected to the binding posts. One pair terminates in the binding post signal entrance box; the other pair on the patch panel jacks.

b. Perform the procedures in (1) and (2) below to extend power ringing to the SB–22/PT.

(1) Use a screwdriver to connect a pair of #20 AWG (or larger gage) wires to the terminals that secure the white-red-brown and white-gray-brown wires to the terminal board at the rear of the patch panel and adjacent to the TA–248/TT.

(2) Connect the other end of the wires ((1) above) to the POWER RING GEN binding posts on the SB–22/PT.

c. Install four Batteries BA–30 (TM 11–2202).

17. Connection of TH–5/TG and 2W–4W Switch

a. Use a screwdriver to release the three captive screws on the front panel of the TH–5/TG and remove the chassis from its mounting (fig. 10).

b. Connect the 2W–4W switch (fig. 27) to the TH–5/TG chassis as follows:

(1) Turn the chassis over and remove the bare strap wire between terminals D2 and F2 (TM 11–5805–246–20). Solder the shielded pair from the 2W–4W switch to the D2 and F2 terminals.

(2) Replace the chassis in its mounting and make the following additional connections on the front panel.

2W–4W switch		TH–5/TG binding posts	
Wire No.	Wire color	Designation	Binding post No.
3	WHT-ORN-GRN	4W–S	3
4	WHT-BRN-BLU	4W–S	4
5	WHT-GRN	4W–R	5
6	WHT-GY-BLU	4W–R	6

c. Insert the TH–5/TG power cord into one of the receptacles on the TT–4A/TG–TH–5TG switchbox (fig. 26).

18. Connection of TT–4A/TG

a. Loosen the knurled nuts and disconnect the dust cover ground leads from the front corners of the dust cover (TM 11–5815–206–12).

b. Push the platen knob inward until it is inside the dust cover.

c. Loosen the web straps and grasp the rear corners of the dust cover to free it from the rear mounting posts and lift it straight up.

d. Connect the black teletypewriter connecting cord to SEND terminals 1 and 2; connect the red teletypewriter connecting cord to REC terminals 3 and 4. Remove the shorting bar between terminals 2 and 3; connect the shorting bar between terminals 5 and 6.

e. For 20-milliampere (ma) line operation, set the D. C. LINE-VOICE FREQ. LINE; for 60-ma line operation, set the switch to D. C. LINE.

f. Install the paper roll and ribbon (TM 11–5815–206–12).

g. Insert the power cord into one of the receptacles on the TT–4A/TG–TH–5/TG switchbox and connect the ground lead. Replace the dust cover and web straps.

19. Connection of TA–312/PT

a. Connect the prepared leads of the telephone cords (fig. 2) to the LINE binding posts on each TA–312/PT.

b. Insert the telephone cord plug connected to TA–312/PT No. 1 (fig. 10) into the PHONE jack on the signal duct. Connect TA–312/PT No. 2 to the TA–312/PT jack on patch panel B (fig. 24).

20. Connection of TS–140/PCM

a. Insert the twin plugs on one of the patching cords provided with the TS–140/PCM (TM 11–2096) into the INPUT jacks on the ME–22A/PCM. Insert the other end of the patching cord into the DB METER INPUT jacks (jack strip 23 TEST) on patch panel B (fig. 24).

b. Insert the twin plugs on a second patching cord into the OUTPUT jacks on the SG–15A/PCM. Insert the other end of the patching cord into the SIGNAL GENERATOR INPUT jacks on patch panel B.

c. Connect the ac power cords from both components to the EQUIPMENT receptacles in the power duct on the roadside wall (fig. 10) behind the patch panel.

Section III. TESTING EQUIPMENT AFTER INSTALLATION

21. General

a. Be sure that the shelter is adequately grounded and the power connections completed (par. 28) before starting the installation tests. Energize the ac circuits (par. 30).

b. Refer to paragraph 29 for information covering the controls and instruments of the S–189/MSC components, and to the appropriate technical manual for information covering operation of the major component operation.

c. Remove field wire and patch cord connections used for testing after the installation tests are completed. Operate circuit breakers and equipment switches to *off*.

22. Installation Test of SB–22/PT

a. Operate EQUIPMENT circuit breaker No. 5 on the power distribution panel (fig. 20) to ON. Operate the power switch for the TA–248/TT (fig. 22) to ON.

b. Remove the TA–312/PT from its storage drawer

c. Connect a length of field wire from the LINE binding posts on the TA–312/PT to binding post pair No. 13 (SB–22/PT LINES 1) in the binding post signal entrance box (fig. 17).

d. Perform talking and ringing tests between the TA–312/PT and the SB–22/PT (TM 11–2202).

e. Repeat the procedure in *c* and *d* above for binding post pairs 14 through 24 in the binding post signal entrance box.

23. Installation Test of TT–4A/TG and TH–5/TG

a. Operate the control on the 2W–4W switch (fig. 27) to FULL DX 4W.

b. Insert the send plug (black) and the receive plug (red) of the TT–4A/TG into the SEND and REC. jacks, respectively, of the TH–5/TG.

c. Insert the 4WS (black) plug and the 2W4WR (red) plug of the 2W–4W switch into any two of the three 21 CONF MULT 1 jacks on patch panel A.

d. Operate the TT–4A/TG–TH–5/TG ON-OFF (fig. 26) to ON.

e. Test the TT–4A/TG and the TH–5/TG as follows:

(1) Operate the MOTOR switch on the TT–4A/TG to On.

(2) Adjust the LINE INCREASE control on the TT–4A/TG to obtain 20 ma on its MILLIAMPERES meter.

(3) Type a test message from the keyboard of the TT–4A/TG. Error-free page copy should be printed.

24. Installation Test of TS–140/PCM

a. Insert a two-wire patch cord plug into the DB METER OUTPUT jack on patch panel B (fig. 24). Connect the other end of the patch cord into the SIGNAL GENERATOR OUTPUT jack on patch panel B.

b. Calibrate and adjust the ME–22A/PCM and SG–15A/PCM (TM 11–2096).

Section IV. PREOPERATIONAL PROCEDURES

25. Siting

a. The location of Panel, Patching, Communication SB–675/MSC in relation to the other components of a signal center in an area-type communication system depends on the tactical situation, local terrain considerations, and the number of 26-pair cables than can be connected between the SB–675/MSC and other signal area components.

b. The shelter should be placed on level concrete blocks or wooden beams, if possible, and positioned to facilitate connection to the power and connector signal entrances boxes. When installed on the ground, the shelter should be located on firm, level, dry ground with good drainage. Avoid, as much as possible, crossing power cables, 26-pair cables, and field wire.

c. When the shelter is installed in a truck, remove the ladder assembly from the floor of the shelter (fig. 8) and secure it to the truck tailgate. Hook the personnel platforms (fig. 8) over the side rails of the truck (fig. 32) near the connector signal entrance boxes.

Note. Power is required for the shelter; however, a generator set is not included as a component of the SB–675/MSC. Information for installation and connection to generator sets, commercial power, or other shelters is included in paragraph 28.

d. If a generator set is used to supply ac power, it should be located approximately 75 feet from the shelter to minimize generator noise interference with shelter operations.

26. Installation of Shelter

Note. To install the shelter on the ground or on a truck, four men and a device capable of lifting 5,000 pounds are required.

a. Lifting and Loading Shelter (fig. 31). If the shelter is to be transported by helicopter, follow the procedures in (1) through (4) below and observe the airlift warning notice mounted on the outside of the shelter. If the shelter is to be installed on a truck, follow the procedures in (1) through (10) below.

(1) Use the sling center hooks (nearest the turnbuckles) (fig. 32) to connect the sling assembly cables to the shelter lifting eyes.

(2) Place the sling assembly on top of the shelter.

(3) Connect the four sling hooks to the lifting ring.

(4) Place the lifting ring over the hook of the lifting device.

Warning: **To avoid injury to personnel and damage to equipment, only the personnel engaged in the actual loading operation should be permitted near the truck, the lifting device, and the shelter. To eliminate confusion, all instructions must come from the loading crew supervisor.**

(5) Tie a ½-inch rope (at least 15 feet long) to each towing eye.

(6) Check to see that all tools and equipment have been removed from the truck body. Lower the tailgate of the truck.

(7) Slowly lift the SB–675/MSC from the ground to a position high enough to clear the body of the truck.

(8) Back the truck into position under the shelter.

Warning: **All personnel must remain clear of the truck while the shelter is being lowered into position.**

(9) Position a man at each of the ½-inch ropes to guide the shelter into position, and slowly lower it into the truck body.

Note. The entrance door of the shelter must be at the rear of the truck, and the front of the shelter against the front of the truck body.

(10) Remove the lifting ring from the lifting hook and disassemble the lifting ring and sling hooks. Remove the sling center hooks from the lifting eyes and the ½-inch ropes from the shelter towing eyes. Raise and secure the tailgate of the truck.

b. Securing Shelter in Truck (fig. 32). Secure the shelter in the truck as follows:

(1) Use the sling hooks farthest from the turnbuckles and hook each of the four sling hooks to a tiedown eye on the shelter.

(2) Use the sling assembly cable attached to the tiedown eye at the left-front of the shelter and place the sling hook nearest the turnbuckle under the side rail and behind the second cargo rack support from the rear of the truck.

(3) Use the sling assembly cable attached to the tiedown eye at the left-rear of the shelter and place the sling hook nearest the turnbuckle under the side rail and in front of the second cargo rack support from the front of the truck.

(4) Follow the procedures in (2) and (3) above, to secure the right side of the shelter.

(5) After the sling assembly cables have been attached to the side rails of the truck, tighten the turnbuckles.

Caution: **To prevent the SB–675/MSC from twisting in the truck body, tighten all the turnbuckles equally at the same time.** ***Do not overtighten the turnbuckles.***

c. Unloading Shelter. Unload the shelter from the truck. The sequence for unloading is the reverse of the lifting and loading and securing sequences (*a* and *b* above).

27. Grounding

The SB–675/MSC must be properly grounded before input power is connected. Select a

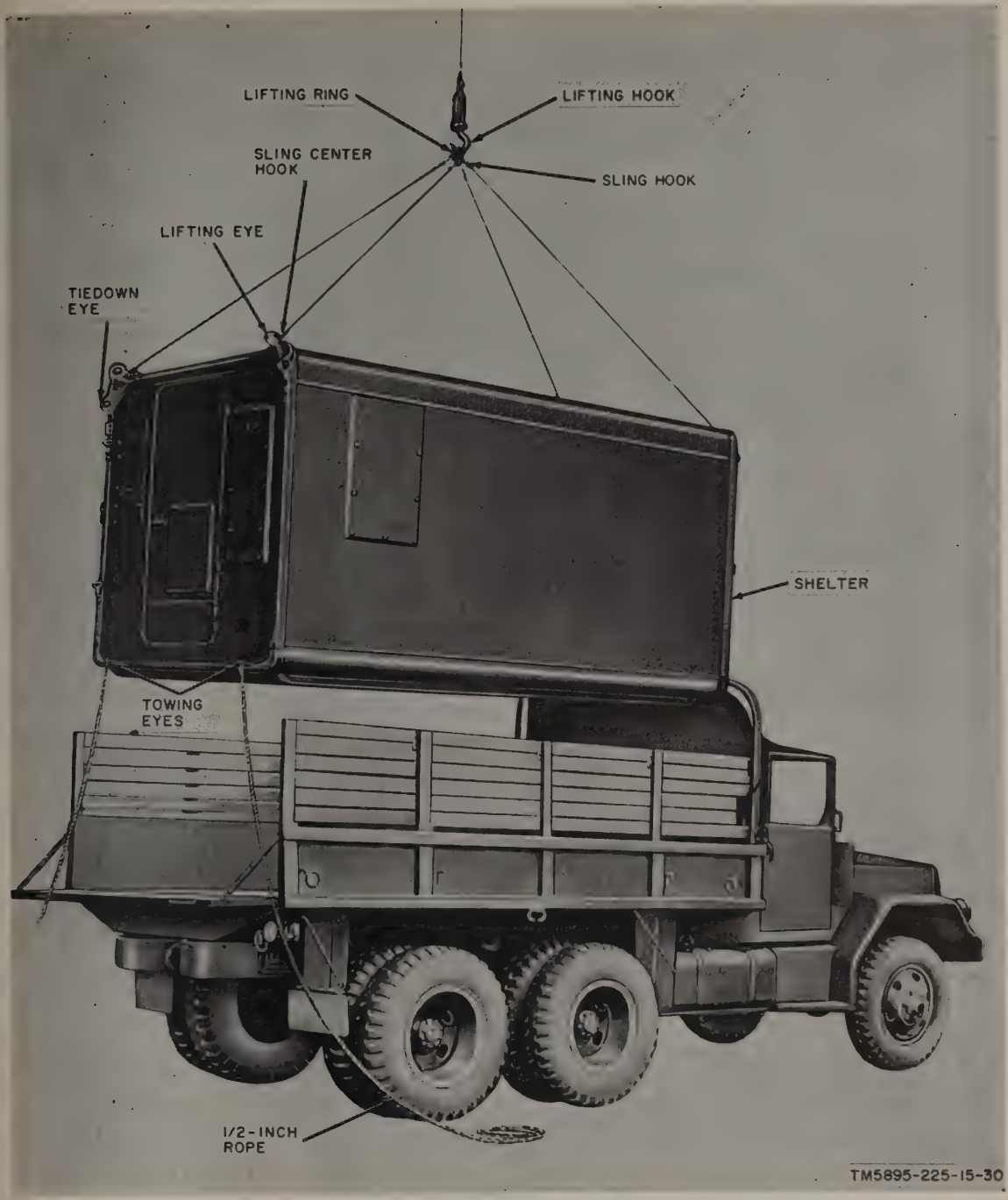


Figure 31. Loading shelter on truck.

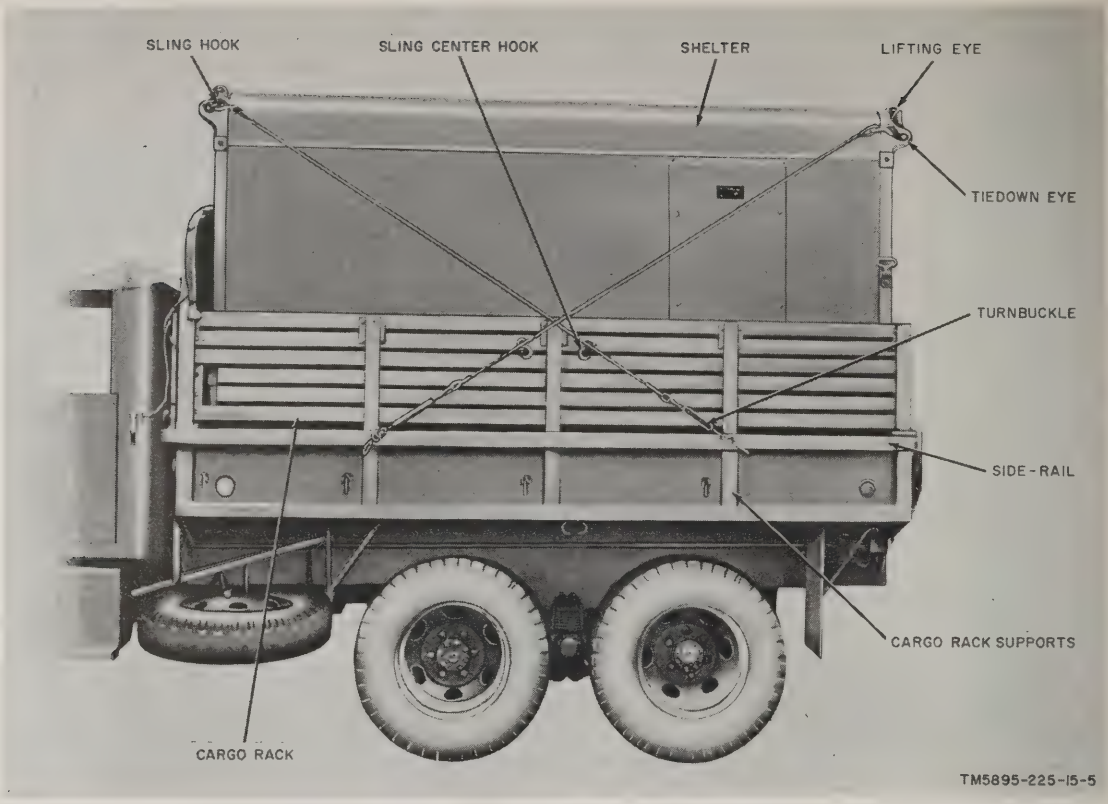


Figure 32. Securing shelter in truck.

grounding site that will not interfere with the entrance door, field wires, or the power cable. Ground the SB–675/MSC as follows:

a. Loosen the captive screws and lift the cover of the power and signal entrance box (fig. 15).

b. Use the cover support to secure the cover in the open position.

c. Remove a ground rod and the sledge hammer (figs. 9 and 12) from their mountings.

d. Select a site within 10 feet of the power and signal entrance box; scoop out a small hole about 6 inches deep.

e. Remove any paint or grease from the ground rod.

f. Drive the ground rod into the hole until the top of the ground rod is approximately 3 inches above ground level.

g. Saturate the ground around the rod with water.

h. Remove a 10-foot ground strap from the shelter storage drawer.

i. Connect one end of the ground strap to the ground rod. Connect the other end of the ground strap to the *GROUND TERMINAL* in the power and signal entrance box (fig. 16).

28. Power Connections

Ac power for the SB–675/MSC may be obtained from an adjacent shelter, a central power source (such as the PU–407/M or PU–408/M), or from a commercial power source.

Caution: **Complete the shelter grounding procedures (par. 27) and ground the ac power source before connecting power to the SB–675/MSC.**

a. Preliminary Procedures. Before making the power connections, proceed as follows:

(1) Make sure that all shelter circuit breakers and equipment switches are in the *off* position.

(2) Remove and store the tiedown bar (fig. 4) and remove the power cable assembly and reel from the shelter.

(3) Unwind the power cable assembly from the reel and remove the connector covers. Store the cable reel.

b. Obtaining Power From Adjacent Shelter. The total power consumption of the SB–675/MSC is 3,832 watts. Be sure that the power source output rating for the adjacent shelter is not exceeded when the SB–675/MSC is connected.

(1) Operate the MAIN circuit breaker on the SB–675/MSC power distribution panel to OFF.

(2) Remove the cover from the IN POWER 115V AC receptacle in the power and signal entrance box (fig. 16) and connect one end of the power cable.

(3) Remove the cover from the OUT POWER 115V AC receptacle in the power and signal entrance box of the adjacent shelter and connect the other end of the power cable.

c. Using Commercial Power.

(1) Turn off or disconnect the commercial power before making any connections.

(2) Remove the power cable stub (fig. 2) from the storage drawer. If the power source is a 50- to 60-cps, 120-240-volt, 1-phase, three-wire distribution system, connect the red and white leads of the power cable stub to the neutral bus bar and the black lead to the remaining bus bar of the commercial source.

(3) If the power source is a 50- to 60-cps, 120-208-volt, 3-phase, four-wire distribution system, connect the red and white leads of the power cable stub to the neutral bus bar and the black lead to the phase 1, phase 2, or phase 3 bus bar.

(4) Remove the cover from the power cable stub connector. Connect the power cable stub to one end of the SB–675/MSC power cable.

(5) Remove the cover from the IN POWER 115V AC receptacle in the power and signal entrance box and connect the other end of the power cable.

29. Controls and Instruments

The descriptions and functions of the controls and instruments of the S–189/MSC components are given in *a* through *j* below. For information concerning the controls and instruments of the major components, refer to the appropriate technical manuals (app. I).

a. Power Distribution Panel fig. 20).

Control, indicator, or instrument	Description and function	
MAIN circuit breaker	To internally ganged 70-ampere circuit breakers. Provides overload protection for 115 volt ac input source and on-off control of ac power to individual circuit breaker switches.	
Individual circuit breakers:	Provide on-off control and overload protection for individual circuits as follows:	
	Rating	*Circuit*
1 LIGHTS	15 amperes	Flourescent lights.
2 BLOWERS	15 amperes	Exhaust blower No. 1 and No. 2 receptacle.
3 HEATER 1	20 amperes	Electric heater No. 1 receptacle.
4 CONVENIENCE	20 amperes	Convenience receptacles.
5 EQUIPMENT	15 amperes	Major components and shelter components receptacles.
6 HEATER 2	20 amperes	Electric heater No. 2 receptacle.
Voltmeter	Ac voltmeter with 0- to 150-volt scale. Indicates ac input voltage from external power source.	
Ammeter	Ac ammeter with 0- to 50-ampere scale. Indicates total current drain from external power source by SB–675/MSC components in use.	
Glowlamps (6)	Neon lamps. Glow when associated circuit breaker switch is on.	

b. Lighting.

Control or indicator	Description and function
BLACKOUT BYPASS switch (fig. 12)	Two-position ON-OFF switch. Controls lighting in the SB–675/MSC for blackout operation as follows: *Sw Pos* — *Permits* ON — Fluorescent lights controlled by individual light switches. OFF — Fluorescent lights coutrolled by door microswitch.
POWER INDICATOR NEON CLAMP (fig. 12)	Neon lamp. Lights when ac power is connected to the SB–675/MSC.
Door microswitch (fig. 12)	Microswitch. Extinguishes fluorescent lights when shelter door is opened. (BLACKOUT BYPASS switch at OFF.)
LIGHT 1 switch (fig. 12)	Two-position ON-OFF switch. Controls three fluorescent lights on roadside of shelter (fig. 14).
LIGHT 2 switch (fig. 12)	Two-position ON-OFF switch. Controls three fluorescent lights on curbside of shelter (fig. 14.)
LIGHT 3 switch (fig. 14)	Two-position ON-OFF switch, Controls fluorescent light above patch panels.
LIGHT 4 switch (fig. 14)	Two-position ON-OFF switch. Controls two fluorescent lights at rear of patch panels.

c. Blowers.

Control	Description and function
BLOWER 1 switch (fig. 10)	Two-position ON-OFF switch. Controls operation of BLOWER 1.
BLOWER 2 switch (fig. 9)	Two-position ON-OFF switch. Controls operation of BLOWER 2.

d. Intercommunication Station RS–147D/FI (fig. 22).

Control or indicator	Description and functions
OFF–SEND switch	Ganged ON-OFF switch and potentiometer. Turns ac power on and off and controls volume of output signal. Switch must be *on* to originate a call.
PRESS TO TALK switch	Two-position nonlocking switch. Must be depressed to originate a call.
RECEIVE control	Potentiometer. Controls speech volume to loudspeaker.
Glowlamp	Neon lamp. One-half of lamp glows when internal dc power supply is operating.

e. Patch Panels (figs. 23, 24, and 25).

Note. The following descriptions and functions apply to all jacks on patch panels A, B, or C, except where indicated. Each jack strip is identified by a number on the left side of the jack panel; the corresponding 26-pair receptacle (figs. 18 and 19) is designated by a number on the right side of the jack panel.

Jack	Description and function
IN jacks (408)	Cutoff jacks. Provide for patching of incoming circuits and disconnect normal-through wiring to outgoing circuits.
IN-PHONE jacks (17)	Terminating jacks. Provide for patching of local incoming telephone lines to other local telephone lines.
IN-INTERCOM jacks (17)	Cutoff jacks. Provide facility for privacy circuit by disconnecting the *incoming* intercom line from the signal area intercom net.
IN-MON jacks (440)	Parallel-connected jacks. Provide for monitoring of all incoming lines.
OUT MON jacks (156)	Parallel-connected jacks. Provide for monitoring of certain predetermined outgoing lines.
OUT jacks (408)	Cutoff jacks. Provide for patching of outgoing circuits and disconnect normal-through wiring to incoming circuits.
OUT-PHONE jacks (17)	Terminating jacks. Provide for patching of local outgoing telephone lines to other local telephone lines.

Jack	Description and function
OUT-INTERCOM jacks (17)	Cutoff jacks. Provide facility for privacy circuit by disconnecting the *outgoing* intercom line from the signal area intercom net.
TELETYPE OUT-TH–5/TG:	
4WS jack	Two-conductor jacks (terminated in patch panel). Provide for patching of teletypewriter monitoring facilities (two- or four-wire basis) to input or output line circuits.
2W–4WR jack (panel A, fig. 23).	
CONF MULT 1–8 jacks (24) (patch panel A and C, figs. 23 and 25).	Parallel-connected jacks (eight sets of three jacks per set). Provide for arrangement of parallel-connected conference circuit.
TELETYPE IN-TH–5/TG:	
4WS jack	Two-conductor jacks (terminated in patch panel). Provide for connection of teletypewriter monitoring facilities (two- or four-wire basis) at the patch panel.
2W–4WR jack (patch panel A, fig. 23).	
HYBD TRANS:	
2W jacks (16)	Terminating jacks. Provide for patching of hybrid transformers 1 through 8 (on patch panel A) and 9 through 16 (on patch panel B) when converting two-wire circuits into four-wire circuits or four-wire circuits into two-wire circuits.
TRANS jacks (16)	
REC jacks (16) (patch panel A and B, figs. 23 and 25).	
MISC jacks (48) (patch panel B, fig. 24).	Terminating jacks. Provide patching facilities, as required, for two *standby* 26-pair cables.
CONF SERIES 1–8 jacks (48) (patch panel B jack strip 21 and 22, fig. 24).	Series-connected jacks (16 sets of three jacks per set). Provide for arrangement of series-connected conference circuits or dc teletypewriter circuits.
CORD TEST OUT:	
2W jack	Two-conductor jacks (short-circuited). Provide a tip-to-sleeve short circuit for testing continuity of two- and four-wire patch cords. (Used with CORD TEST IN jacks.)
4W–2W jack (patch panel B, fig. 24).	
CORD TEST IN:	
2W jack	Two conductor-jacks. Provide for connecting two- and four-wire patch cords to ohmmeter circuit during continuity test. (Used with CORD TEST OUT jacks.)
4W–2W jack (patch panel B, fig. 24).	
TA–312/PT jacks (2) (patch panel B, fig. 24)	Terminating jacks. Provide the facility for connecting TA–312/PT No. 2, or a headset equipped with twin connecting plugs, to signal area telephone circuit.
SIGNAL GENERATOR:	
INPUT jacks (2)	Two-conductor jacks (parallel-connected). Provide for connecting twin plug on *output* cord of SG–15A/PCM to patch panel.
OUTPUT jack (patch panel B, fig. 24)	Two-conductor jack. Provides for patching SG–15A/PCM to circuit undergoing test or alinement.
DB METER:	
INPUT jacks (2)	Two-conductor jacks (parallel-connected). Provide for connecting twin plug on *input* cord of ME–22A/PCM to patch panel.
OUTPUT jack (patch panel B, fig. 24)	Two-conductor jack. Provides for patching ME–22A/PCM to circuit undergoing test or alinement.
TEST METER:	
VOLTS jack	Two-conductor jack. Provides for patching of VOLT-OHM METER (arranged as voltmeter) to circuit undergoing test.
OHMS jack (patch panel B, fig. 24)	Two-conductor jack. Provides for patching of VOLT-OHM METER (arranged as ohmmeter) to circuit or patch cord undergoing test.
EXTERNAL WIRE LINES-BINDING POSTS 1–12 jacks (12) (patch panel B, fig. 24).	Two-conductor jacks. Provide for patching to field wire lines connected in binding post signal entrance box.
20 CYCLE RING jack (patch panel B, fig. 24)	Two-conductor jack. Extends output from TA–248/TT to patch panel for use during testing.
SB–22/PT LINES 11–12 jacks (patch panel C, fig. 25).	Parallel-connected jacks. Provide for patching of any signal circuit to SB–22/PT (lines 11 and 12 *only*).
PHONE jacks (2), (patch panel B; jack strips 18 and 19, fig. 24).	Two-conductor jacks. Provide facility for direct circuit over 26-pair receptacles SIGNAL 23 or SIGNAL 24.
INTERCOM jacks (2) (patch panel B; jack strips 18 and 19, fig. 24).	Cutoff jacks. Provide facility for privacy circuit over 26-pair receptacles SIGNAL 23 or SIGNAL 24.
LOCAL INTERCOM jack (patch panel C, fig. 25)	Cutoff jack. Provides facility for privacy circuit over SB–675/MSC intercom.

f. Signal Duct.

Jack	Description and function
PHONE jack (fig. 10)	Terminating jack. Provides for connection of TA–312/PT No. 1 through the signal duct to the external line circuit.

g. TT–4A/TG TH=5/TG Switchbox (fig. 22).

Control or indicator	Description and function
ON-OFF switch	Two position toggle switch. Controls 115 volts ac to the duplex receptacle.
Glowlamp	Neon lamp. Indicates that 115 volts as is being applied to the duplex receptacle.
Power receptacle	Duplex receptacle. Provides for connection of the TT–4A/TG and the TH–5/TG power cords.

h. Electric Heater (fig. 21).

Control	Description and function
HEAT-OFF-FAN switch	Three-position toggle switch. *Sw Pos* — *Function* HEAT — Applies ac power to heater element and fan motor. OFF — Disconnects ac power from heater element and fan motor. FAN — Applies ac power to fan motor only.
TEMPERATURE CONTROL	Thermostat control. Regulates the temperature provided by the heating element.
RESET pushbutton	Pushbutton that resets the protective circuit breaker within the heater.

i. VOLT-OHM METER (fig. 28).

Control, instrument, or jack	Description and function
VM-RES. switch	Two-position toggle switch. *Sw Pos* — *Zrranges* VM — Meter circuitry for dc voltage measurements. RES. — Meter circuitry for resistance measurements.
BATTERY ADJUSTMENT control	Potentiometer. Provides for calibration of meter needle prior to resistance measurements.
X, R, Rx10, Rx100, and Rx1000 jacks	Pin jacks. Select the appropriate meter range for resistance measurements.
—, 3V, 30V, 300V, and 600V jacks	Pin jacks. Select the appropriate meter range for voltage measurements.
OHMS-X and OHMS-R binding posts	Binding posts. Provide wiring tie-point between meter resistance pin jacks and associated test jacks on patch panel B.
VOLTS — and VOLTS + binding posts	Binding posts. Provide wiring tie-point between meter voltage pin jacks and associated test jacks on patch panel B.
Meter	Milliammeter with 0- to 300-volt, 0- to 600-volt, and 0 to INF scale. Indicates dc voltage and resistance of circuits tested.

j. 24–4W Switch (fig. 27).

Control	Description and function
FULL DX4W-HALF DX 4W–2W	Three-position switch. Switches the operation of the TH–5/TG from two-wire to four-wire half-duplex or four-wire full-duplex operation. Works in conjunction with the 4W-2W-TEL switch on the TH–5/TH.

30. Energizing Ac Circuits

Perform the following preliminary starting procedures to prepare the SB–675/MSC for operation.

a. When the power is obtained from an adjacent shelter, check the power cable connections (par. 28). The POWER INDICATOR NEON LAMP will be lighted.

b. When a commercial power source is used, apply power from source terminals.

c. Operate the MAIN circuit breaker on the power distribution panel (fig. 20) to ON.

d. Operate the BLACKOUT BYPASS switch (fig. 12) to ON. When blackout conditions are required, operate the switch to OFF.

e. Operate circuit breaker No. 1 LIGHTS to ON.

f. Operate the LIGHT 1 and LIGHT 2 switches (fig. 12) to ON. If required, operate the LIGHT 3 and LIGHT 4 switches (fig. 14) to ON.

g. Check the voltmeter (fig. 20). It should indicate 115 volts ac ±10.

h. Check the ammeter. It should indicate nearly 0 ampere.

i. Operate circuit breakers No. 2 through No. 6 to ON.

j. Operate the ON-OFF switch on the TT–4A/TG–TH–5/TG switchbox to ON.

Section V. SIGNAL CONNECTIONS

31. General

a. A total of 936 two-wire circuits can be connected by cables to the SB–675/MSC; a total of 24 two-wire circuits can be connected by field wire to the binding posts. Local, trunk, and other circuits can be connected at the connector signal entrance boxes (fig. 18 and 19), the binding post signal entrance box (fig. 17), or the power and signal entrance box (fig. 16).

b. Normally, most local and trunk circuits will be connected to the SB–675/MSC by 26-pair cables (par. 33). Connections to the SB–22/PT (par. 34) are made at the SB–22/PT LINES binding posts in the binding post signal entrance box; 12 additional field wire circuits may be connected at the EXTERNAL WIRE LINES binding posts. Local area telephone and LS–147D/FI lines are connected at the PHONE 1 and INTERCOM binding posts in the power and signal entrance box.

c. Flexibility of line circuit assignments is provided by the SB–675/MSC. *Through* circuits should be assigned to 26-pair receptacles terminated in jack strips designated IN and OUT (figs. 23, 24, and 25). Signal circuits that require a maximum of monitoring should be assigned to those 26-pair receptacles that terminate in jack strips provided with both incoming monitoring facilities (IN MON) and outgoing monitoring facilities (OUT MON). Auxiliary, spare, or miscellaneous equipment circuits should be assigned to 26-pair receptacles SIGNAL 23 and SIGNAL 24 that terminate on the MISC jack strips on patch panel B.

32. Use of Distribution Box J–2317/U

a. During normal field operations, all the pairs in a 26-pair cable might not be used. Because of the design of the SB–675/MSC, every pair in a 26-pair cable is connected to a jack on the jack strip. As a result, jacks connected to unused cable pairs remain idle and reduce the operational flexibility of the SB–675/MSC. The use of the J–2317/U as an IDF (par. 35) consolidates the used pairs from two or more 26-pair cables into a single 26-pair cable that can be terminated on a single jack strip on the patch panel.

b. The use of an externally mounted IDF at the SB–675/MSC site will also provide facilities for making cross-connections of 26-pair cables and will reduce the number of patch connections within the SB–675/MSC. An IDF can also be used in command posts or army-area signal centers that have established a standing operating procedure (sop) for the use of each line in a local wire system. When used in this manner, the J–2317/U's would speed installation time of local communication facilities and reduce or eliminate wiring mistakes. Figure 33 shows the J–2317/U's mounted on an improvised H-frame and arranged to provide these facilities.

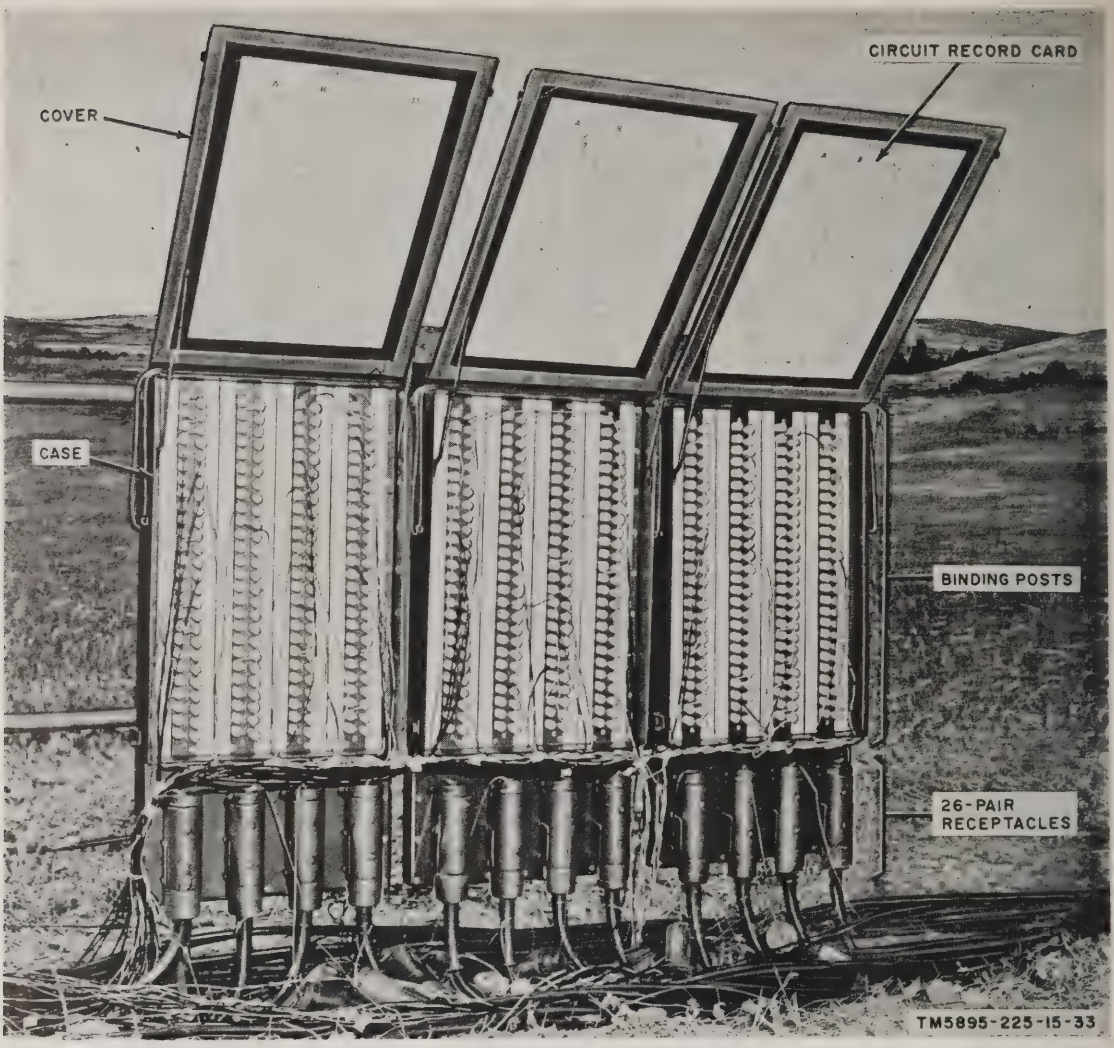


Figure 33. Distribution Boxes J–2317/U, installed and arranged as intermediate distribution frames.

33. Connection of 26–Pair Cables

(figs. 34 and 35)

To couple connectors on 26-pair cables, 26-pair cable stubs, or 26-pair patching cables, and to connect the 26-pair cables to the receptacles in the connector signal entrance boxes, follow the procedures in *b* below.

a. Coupling 26-Pair Connectors (fig. 34).

Caution: **Handle the 26-pair connectors with care during the coupling and uncoupling procedures. Do not force or twist the connectors during installation. Never drop or place an uncovered 26-pair connector on the ground.**

(1) *Cover removal.*

(*a*) With both hands, grasp the knurled collar on each end of the connector and turn the collars until the open position is reached (A, fig. 34).

(*b*) Disengage the cam on top of the cover from the slot on the connector collar. Lift and remove the cover (B, fig. 34).

(2) *Coupling procedures.*

(*a*) Position the two 26-pair connectors so that the connector cams drop into the slots of the knurled collars and

the male contacts of each connector are alined with the female contacts of the other connector (C, fig. 34).

(*b*) Carefully press the two connectors together (D, fig. 34).

(*c*) Lock the connectors by turning the knurled collars until the closed position is reached (E, fig. 34).

(*d*) Lock the connector covers together.

(3) *Uncoupling procedures.*

(*a*) Unlock the 26-pair connectors by turning the knurled collars until the open position is reached (A, fig. 34).

(*b*) Carefully pull the connectors apart.

(4) *Cover replacement.*

(*a*) Unlock the two connector covers.

(*b*) Position the cover on top of the 26-pair connector.

(*c*) Engage the cam on the top of the cover in the slot on the connector collar (A, fig. 34).

(*d*) Lock the cover to the connector by turning the collars until the closed position is reached.

Figure 34. Coupling 26-pair connectors.
(Located in back of manual)

b. Connecting 26-pair Cables in Connector Signal Entrance Box (fig. 35).

Note. When performing the connecting procedures in (2) below, inform the operator at the patch panel of the area system component identified with the 26-pair cable being connected to the SB–675/MSC. The operator can then record the component type number on the designation strip above the appropriate jack strip.

(1) *Preliminary procedures.*

(*a*) When the SB–675/MSC is mounted in a truck, remove the personnel platforms (fig. 8) from inside the shelter and hook them on the sides of the truck bed near the connector signal entrance boxes.

(*b*) Loosen the fasteners on the connector signal entrance box covers. Use the cover support to secure the covers in the open position.

(2) *Connecting procedures.*

Note. The cable end of the connectors is used as a reference for clockwise and counterclockwise rotations.

(*a*) Remove the covers from the 26-pair connectors and receptacles (*a*(1) above).

(*b*) Connect the 26-pair cables to the receptacles in numerical order; start with the lowest receptacle number in each connector signal entrance box.

(*c*) Position the 26-pair connector on the receptacle so that the cams drop into the slots of the knurled collars and the male contacts are alined with the female contacts (E and F, fig. 35).

(*d*) Carefully press the connector into the receptacle.

(*e*) Turn the lever on the receptacle knurled collar counterclockwise until the collar engages the cam.

(*f*) Turn the knurled collar on the connector clockwise until the sleeve just engages the cam.

(*g*) Simultaneously turn the receptacle collar lever and the connector collar until the closed position is reached (G, fig. 35).

(3) *Disconnecting procedures.*

(*a*) Simultaneously turn the receptacle collar lever and the connector collar until the open position is reached.

(*b*) Carefully pull the connector from the receptacle.

(*c*) Replace the covers (*a*(4) above).

Figure 35. Connecting 26-pair connector to 26-pair receptacle.
(Located in back of manual)

34. Field Wire Connections

Connect the field wire pairs to the binding posts in the J–2317/U, J–1077A/U, the binding post signal entrance box (fig. 17), and the PHONE 1 and INTERCOM binding posts in the power and signal entrance box (fig. 16) as described in *a* through *d* below.

a. Loosen the fasteners on the entrance box covers. Use the cover support to secure each cover in the open position.

b. Remove ½ inch of insulation from the end of each field wire line that is to be connected.

c. Press down on the binding posts to open the wire slot. Place the field wire pairs in the appropriate slot and release the binding post.

d. Distribute and retain all wires in the bridle rings associated with each row of binding post pairs.

35. Connecting J–2317/U as IDF

a. Remove one or more J–2317/U's from the shelter (fig. 8).

b. Use field wire or the canvas carrying strap and secure the J–2317/U to the side of a vehicle, to a tree, or to an improvised H-frame.

c. Release the fasteners and raise and lock the cover in the open position (fig. 33).

d. Connect three incoming 26-pair cables that use only a minimum number of pairs in each cable to 26-pair receptacles A, B, and C on the J–2317/U.

e. Use field wire and cross-connect between the binding posts associated with the used cable pairs and the binding posts associated with 26-pair receptacle D on the J–2317/U. Distribute and retain the wires in the bridle rings.

f. Use a grease pencil to record all connection data on the circuit record card.

g. Connect one end of a 26-pair patching cable to receptacle D. Connect the other end of the 26-pair patching cable to the appropriate 26-pair receptacle in the connector signal entrance box on the SB–675/MSC.

h. Secure the cover on the J–2317/U.

36. Connecting Procedures for J–1077A/U

The J–1077A/U's supplied with the SB–675/MSC can be used to connect field wire lines into 26-pair cable, to provide additional binding post terminations for field wire facilities, and to serve as an emergency patch panel.

a. Preliminary Procedures.

(1) Remove the J–1077A/U from the wall storage bracket (figs. 9 and 10).

(2) Release the fasteners and open the cover.

b. Connecting Field Wire into 26-Pair Cable.

(1) Place the J–1077A/U adjacent to the coupled connectors of the 26-pair cables.

(2) Uncouple the 26-pair cables and connect them to the 26-pair receptacles on the J–1077A/U.

(3) Connect the prepared leads on the 26-pair cable stub to the appropriate binding posts in the J–1077A/U.

Note. The wire colors of the 26-pair cable stub are the same as the wire colors of the 26-pair cable.

(4) Connect the other end of the 26-pair cable stub to the appropriate 26-pair receptacle in the connector signal entrance box on the SB–675/MSC.

(5) Use a grease pencil to record all connection data on the circuit record card located inside the cover. Secure the cover on the J–1077A/U.

c. Terminating Field Wire Circuits.

(1) Start with the No. 1 binding post pair and connect the field wire pairs to the binding posts in the J–1077A/U. Distribute and retain the field wire in the bridle rings.

(2) Connect one end of a 26-pair patching cable to one of the receptacles on the J–1077A/U.

(3) Connect the other end of the 26-pair patching cable to the appropriate 26-pair receptacle in the connector signal entrance box on the SB–675/MSC.

(4) Secure the cover on the J–1077A/U.

d. Providing Emergency Patching Procedures.

(1) Connect an *incoming* 26-pair cable to a receptacle on the J–1077A/U.

(2) Connect an *outgoing* 26-pair cable to a receptacle on a second J–1077A/U.

(3) Use field wire and cross-connect between the appropriate binding post pairs in each J–1077A/U.

(4) Use a grease pencil to record all connection data on the circuit record card.

(5) Distribute and retain the field wire in the bridle rings. Close and secure the covers.

CHAPTER 3
OPERATING INSTRUCTIONS

37. Operating Facilities

a. The SB–675/MSC provides facilities for handling up to 408 *through* circuits or lines for the various components within the area-type communication system. Facilities are provided to rearrange circuits on a two-wire or four-wire basis. Facilities are also provided for monitoring telephone and teletypewriter circuits.

b. Components within the area system that are connected to the SB–675/MSC depend on the trunking, patching, and connecting arrangements provided at the SB–675/MSC. Therefore, the patch panel operator *must* maintain an accurate record of all circuit assignments so that patch cords can be changed when line facilities are rerouted, or when it is necessary to provide an immediate replacement for a defective circuit. After communication has been established, the test facilities of the SB–675/MSC can be used to sectionalize the trouble.

38. Operating Procedures

The initial adjustments and operating procedures for the major components of the SB–675/MSC are given in their respective technical manuals (app. I). Follow the procedures below to place the shelter components in operation. Refer to paragraph 29 for an explanation of the applicable controls and instruments.

a. Electric Heaters (fig. 21).

(1) Connect the power cords to the HEATER receptacles (figs. 9 and 12).

(2) Operate the HEAT-OFF-FAN switch to the desired position.

(3) If the HEAT-OFF-FAN switch is operated to HEAT, set the TEMPERATURE CONTROL to the desired setting.

b. Intercommunication Station LS–147D/FI (fig. 22).

(1) Connect the LS–147D/FI power cord to the power receptacle box at the rear of the patch panel.

(2) Operate the OFF-SEND switch to 5 (approximately midposition). The glowlamp will light.

(3) Operate the PRESS TO TALK switch and speak into the speaker-microphone on the intercom panel; release the PRESS TO TALK switch to receive.

Note. The OFF-SEND switch does not have to be *turned on* to receive a call.

(4) Operate the RECEIVE control to regulate the volume of incoming calls.

c. Exhaust Blowers.

(1) Open the air vent cover in the shelter door (fig. 15) and the blower vent covers on the front of the shelter.

(2) Operate the BLOWER 1 and BLOWER 2 switches (figs. 9 and 10) to ON, as desired.

39. Patching Procedures

a. General. Patching is not generally required at the SB–675/MSC to complete circuit requirements. Patching is used to reroute circuits as a result of line or equipment failures, or to meet changing circuit requirements within the signal area. Patch cords of various types, colors, and lengths (fig. 3) are provided for use at the patch panel. Select the patch cord that meets the particular patching requirement. The color of the patch cord has no significant meaning with respect to certain patching operations; the different colors can be used to facilitate locating a particular cord from among others on a heavily patched panel. The patching procedures in *b* through *n* below are *typical examples* provided to acquaint the operator with routine patching operations. In the following diagrams, patch panel designations, such as AN/MCC–6 2W and AN/MTC–1 2W, are used to represent the circuit identification recorded by the operator on the patch panel designation strips.

b. Patching Two-Wire Telephone Circuit (fig. 36). Connect the patch cord between the appropriate patch panel jacks as shown in figure 36.

c. Patching Four-Wire Full-Duplex Vf Teletypewriter Circuit.

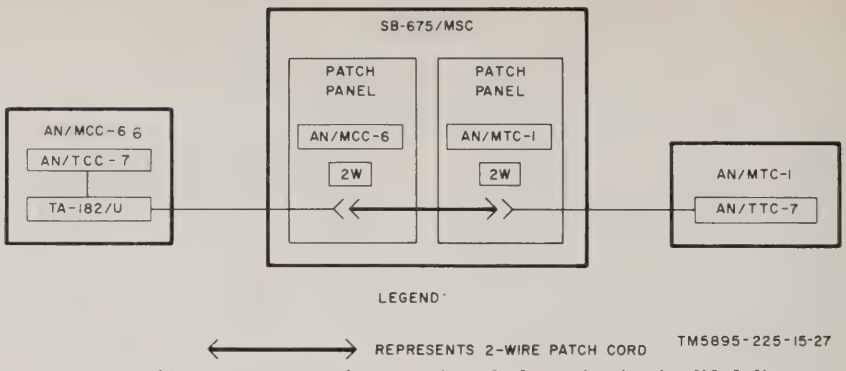


Figure 36. Patching arrangement for two-wire telephone circuit, simplified diagram.

Caution: **Mark the top or bottom of the four-wire patch cord plug shells to prevent reversing the line pairs during the patching operation.**

(1) At the patch panel, insert one end of a four-wire patch cord into the pair of appropriate jacks connected to the local teletypewriter station equipment. Keep the top of the plug shell *up*.

(2) Insert the other end of the patch cord into the pair of line circuit jacks connected to the distant station. Keep the top of the plug shell *up*.

d. Patching Hybrid Circuit (fig. 37). Connect the patch cords between the appropriate patch panel jacks as shown in figure 37.

e. Patching SB–22/PT Line (fig. 38). Connect the patch cord between the appropriate patch panel jacks as shown in figure 38.

f. Patching AN/TCC–7 Channels Back to Back (Tandem) (fig. 39). Connect the 5-db patch cord between the appropriate patch panel jacks as shown in figure 39.

Note. Reverse the line pairs (send and receive) during the patching operation.

g. Patching Into Multiple Jacks (fig. 40). Connect the patch cords between the appropriate jacks as shown in figure 40.

h. Isolating LS–147D/FI From Intercom Circuit Network. To establish a direct circuit between any particular shelter within the signal area and the SB–675/MSC, connect one end of a two-wire patch cord into the appropriate INTERCOM jack, and the other end of the patch cord into the LOCAL INTERCOM jack on the patch panel C.

i. Twenty-Cycle Ringing Tests. To perform ringing tests for switchboard line drops, TA-182/U's or TA–312/PT's connected to the SB–

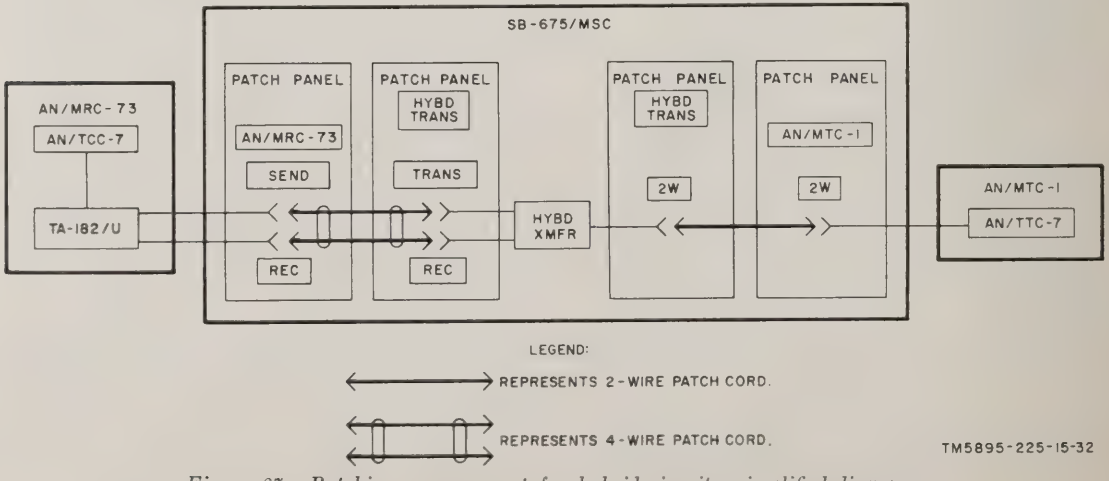


Figure 37. Patching arrangement for hybrid circuits, simplified diagram.

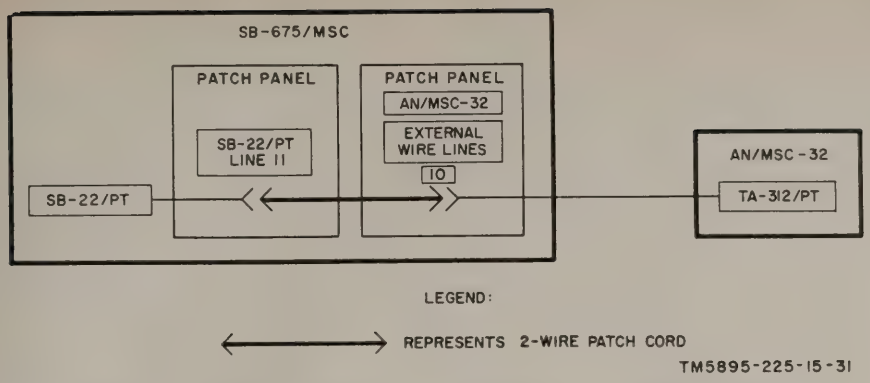


Figure 38. Patching arrangement for SB–22/PT line, simplified diagram.

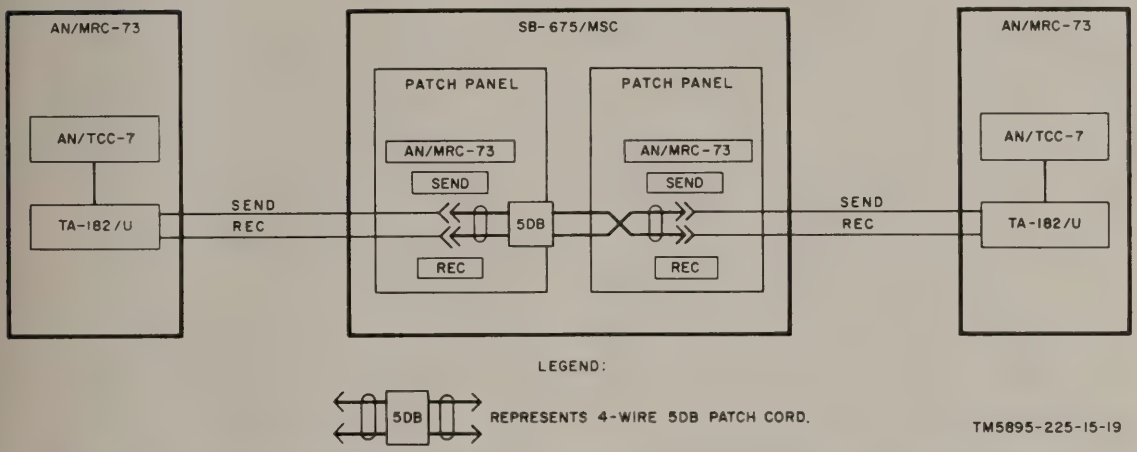


Figure 39. Back-to-back (tandem) patching arrangement for AN/TCC–7 channels, simplified diagram.

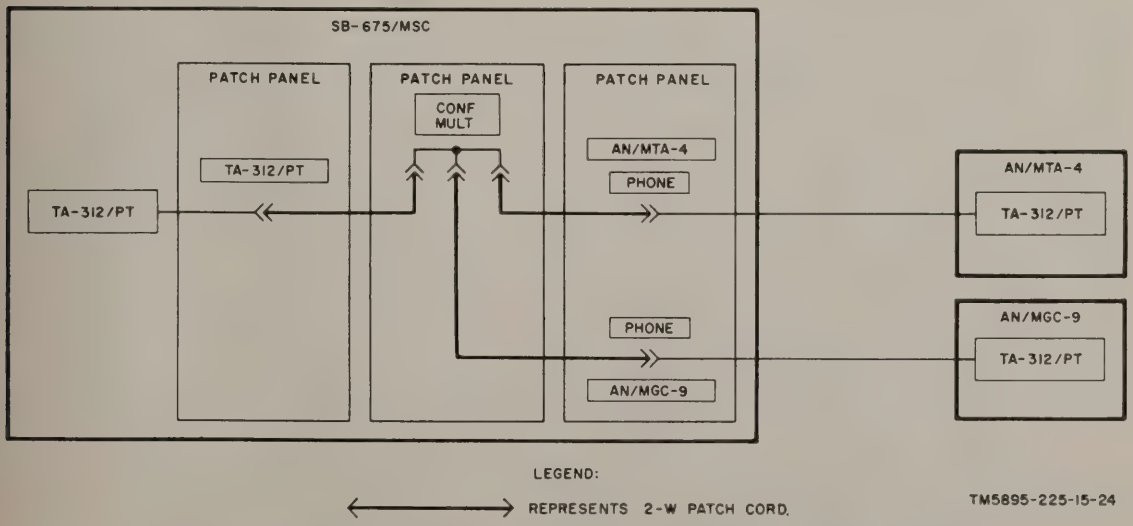


Figure 40. Patching arrangement for conference multiple jacks, simplified diagram.

675/MSC, insert one end of a two-wire patch cord into the 20 CYCLE RING jack on patch panel B, and the other end of the patch cord into the appropriate line circuit jack. At the intercom panel, operate the 20 ~ RINGING switch to ON.

j. Sending Test Frequencies. To send test frequencies on the channels of a system to establish operating levels, or to aid in trouble location, insert one end of a two-wire patch cord into the SIGNAL GENERATOR OUTPUT jack, and the other end of the patch cord into the appropriate line circuit jack.

k. Measuring Transmission Levels. To measure transmission levels on the channel of a system, or to aid in trouble location, insert one end of a two-wire patch cord into the DB METER OUTPUT jack, and the other end of the patch cord into the appropriate line circuit jack.

l. Making Voltage Measurements. To perform voltage measurements on dc telegraph circuits, or when testing lines for foreign battery, follow the procedures below.

(1) At the VOLT-OHM METER (fig. 28), check to see that the test probe is in the 300V pin jack.
(2) Set the function switch on the VOLT-OHM METER to VM.
(3) At the patch panel B, insert one end of a two-wire patch cord into the TEST METER-VOLTS jack and the other end of the patch cord into the appropriate line circuit jack.
(4) Move the test probe to the proper voltage jack to obtain a center-scale meter indication. Observe and record the indication on the VOLT-OHM METER.

m. Making Resistance Measurements. To perform resistance measurements of signal lines for testing and fault locating, follow the procedures below.

(1) Set the function switch on the VOLT-OHM METER to RES.
(2) At patch panel B, insert one end of a two-wire patch cord into the TEST METER-OHMS jack and the other end of the patch cord into the appropriate line circuit jack.
(3) At the VOLT-OHM METER, move the test probe to the proper multiplier (RX) jack to obtain a center-scale meter indication.

n. Testing Patch Cords. To test the patch cords, use the CORD TEST circuit on patch panel B and arrange the VOLT-OHM METER as an ohmmeter as follows:

(1) At patch panel B, insert one end of a two-wire patch cord or a four-wire patch cord into the CORD TEST IN 2W jack or the 4W jacks, respectively.
(2) Set the function switch on the VOLT-OHM METER to RES. Insert the test probe into the RX 10 jack.
(3) At patch panel B, insert the other end of the patch cord under test into the CORD TEST OUT 2W jack or the 4W jack, as applicable.
(4) Observe the indication on the VOLT-OHM METER; it should be zero for a patch cord without a 5-db pad and will indicate the equivalent resistance for a 5-db patch cord.

40. Monitoring Procedures

a. Telephone Circuits. At patch panel B, insert one end of a two-wire patch cord into the TA–312/PT jack. Insert the other end of the patch cord into the MON (IN or OUT) jack of the line circuit being monitored.

b. Voice-Frequency Telegraph Circuits.

(1) *Preliminary*
(*a*) Arrange the TH–5/TG (TM 11–5805–246–10), the TT–4A/TG (TM 11–5815–206–12), and the 2W–4W switch (fig. 27) for the applicable type of operation (two-wire half-duplex or four-wire full-duplex).
(*b*) Insert the red and black plugs of the TT–4A/TG connecting cords into the TH–5/TG REC. and SEND jacks respectively.
(*c*) At patch panel A, insert the red and black connecting cords of the 2W–4W switch into the TELETYPE IN A TH–5/TG 2W4WR and 4WS jacks, respectively.
(2) *Two-wire half-duplex circuits.* At patch panel A, insert one end of a two-wire patch cord into the TELETYPE OUT TH–5/TG 2W4WR jack and the other end of the patch cord

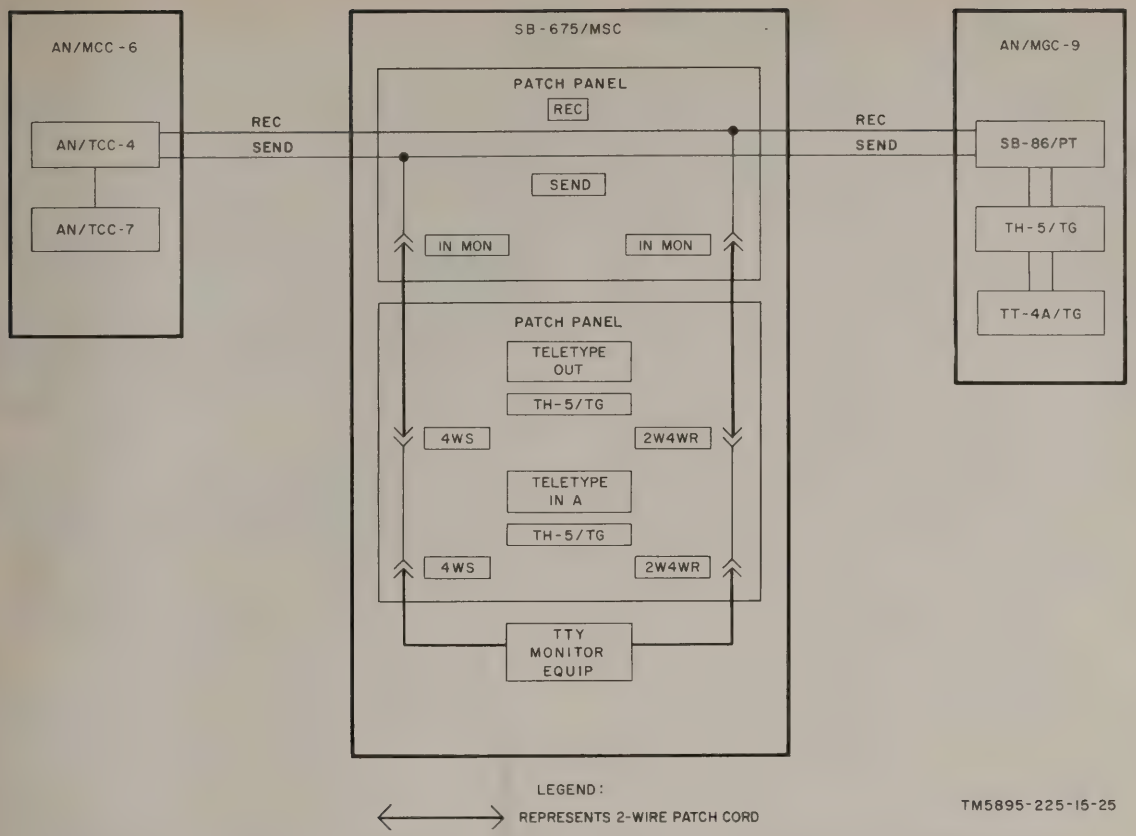


Figure 41. Patching arrangement for four-wire full-duplex circuit monitoring, simplified diagram.

into the MON (IN or OUT) jack of the circuit being monitored.

(3) *Four-wire full-duplex circuits* (fig. 41). Connect the patch cords between the appropriate patch panel jacks as shown in figure 41.

41. Stopping Procedures

Note. To turn the power off in an emergency, operate the MAIN circuit breaker to OFF.

a. Major Components. Refer to the applicable technical manuals (app. I) for the appropriate stopping procedures. Except in an emergency, turn off all major components before operating the EQUIPMENT circuit breaker in the power distribution panel to OFF.

b. S–189/MSC Components.

(1) *Intercommunication Station LS–147D/FI.* Operate the OFF-SEND switch to OFF.

(2) *Electric heaters.* Operate the TEMPERATURE CONTROL to its lowest setting and the HEAT-OFF-FAN switch to OFF.

Note. After the major components (*a* above) and the electric heaters have been turned off, allow the blowers to remain in operation for at least 10 minutes before completing the stopping procedures and closing the shelter door.

(3) *Blowers.* Operate the BLOWER 1 and BLOWER 2 switches to OFF. Close the air vent cover in the shelter door and the blower vent covers on the front of the shelter.

(4) *TT–4A/TG–TH–5/TG switchbox.* Operate the ON-OFF switch to OFF.

(5) *Voltohmmeter.* Operates the VM-RES. switch to VM.

c. Circuit Breakers and Light Switches. Operate all circuit breakers and light switches to OFF.

d. Patch Cords. Remove all patch cords and place them on the hangers on each end of the patch panels (fig. 11).

42. Operation Under Adverse Climatic Conditions

The SB–675/MSC has been designed to meet conditions of extremely cold or hot climates. The shelter offers complete protection from the elements for personnel and equipment; however, when the entrance boxes (fig. 15) are exposed to adverse conditions, the following precautions are necessary.

a. Cold Climates. Extreme cold causes cables and wires to become hard, brittle, and difficult to handle. Be careful when handling the cables and connecting them to the shelter so that kinks and unnecessary loops will not result in permanent damage. To make sure that the binding posts and the 26-pair receptacles on the outside of the shelter are kept free of frost, snow, and ice, replace the covers over the receptacles and close the covers over the entrance boxes and distribution boxes when they are not in use. Lower the folding side panels whenever the entrance box covers are open. Replace the connector cover on a 26-pair cable as soon as the cable is disconnected from the equipment; never drag or place an open connector in snow.

b. Hot Climates. In hot, dry climates, the 26-pair connectors and receptacles and binding posts are subject to damage from dirt and dust. Close the covers on the entrance boxes and the distribution boxes when they are not in use; replace the covers over the connectors and receptacles. Lower the folding side panels whenever the entrance box covers are open. Never drag or place an open 26-pair connector on the ground.

c. Warm, Damp Climates. In warm, damp climates, the equipment is subject to damage from moisture and fungi. Wipe all moisture and fungi from the exterior of the equipment with a lint-free cloth.

CHAPTER 4
MAINTENANCE

Section I. OPERATOR'S MAINTENANCE

43. General Maintenance

Clean and inspect all components of the SB–675/MSC regularly. Detailed maintenance procedures pertaining to the major components are described in the appropriate technical manuals (app. I).

a. Use a clean, dry, lint-free cloth or brush for dusting.

b. If cleaning is necessary, moisten a cloth or brush with cleaning compound (FSN 7930–395–9542); after cleaning, wipe dry with a cloth. Do not use cleaning compound on electrical contacts.

Warning: **Cleaning compound is flammable and its fumes are toxic. Do not use near a flame; provide adequate ventilation.**

c. Dry, compressed air, not exceeding 60 pounds per square inch, may be used to remove dust from inaccessible places.

Warning: **Compressed air is dangerous and can cause serious damage to eyes, ears, nose, and other parts of the body. It can also cause mechanical damage to the equipment. Do not use compressed air to dry parts where cleaning compound has been applied.**

44. Tools, Test Equipment, and Materials

a. Tools and Test Equipment. The tools and test equipment required for operator's maintenance of the major components are listed in the appropriate technical manuals (app. I). The tool roll kit (fig. 2) is required for maintenance of the S–189/MSC components.

b. Materials.

Item No.	Item	Federal stock No.
1	Abrasive, sheet: crocus cloth, 9-by 11-in.	Ord[d]
2	Abrassive, sheet: sandpaper 0000; 9- by 12-in. sheets.	627500–0000[a]
3	Cleaning compound	7930–395–9542
4	Cloth, textile: cheesecloth; lint-free; 36-in.	408–2701[b]
5	Grease, graphite, aircraft (GGA)	9150–223–4001[c]
6	Lubricating oil, general purpose, preservative (PL special).	9150–185–0629[c]
7	Lubricating, oil, internal combustion engine, OE–10.	9150–265–9425[c]
8	Orangestick	5120–408–4036
9	Polish, metal; paste	6G1516[a]
10	Tape TL–83	5970–184–2003

[a] Signal Corps stock number.
[b] Interim Federal stock number.
[c] Quartermaster Corps stock number.
[d] Ordnance Corps items.

45. Daily Preventive Maintenance

a. Check for completeness and general condition of the equipment and spare parts.

b. Remove dirt, dust, grease, and moisture from the exposed parts.

c. Remove rust, corrosion, fungi, dirt, and moisture from the binding posts and cable connectors, and the receptacles.

d. Inspect the field wire connections at the binding posts for good contact.

e. Inspect the lettering on the patch panel designation strips for legibility.

f. Inspect the ground rod and ground strap connection. Feel the power cable to see if it is overheating.

g. Inspect all exposed cables for kinks, strains, moisture, fungi, and loose terminals, and frayed, cut, or damaged insulation.

h. Tighten loose mounting hardware.

i. Check the ladder assembly and personnel platforms for secure mountings.

46. Weekly Preventive Maintenance

a. Clean and tighten the components, racks, mountings, installations, cables, and connectors.

b. Inspect the components, racks, mountings, installations, and the exposed metal surfaces for rust, corrosion, and moisture.

c. Inspect the cables and wires for cuts, breaks, fraying, deterioration, kinks, and strain.

d. Inspect for looseness of accessible items, such as switches, signal and ac cable assemblies, and glowlamps.

e. Clean the air filter, nameplates, the meters, and the clock.

f. Inspect the meters and the clock for damaged glass and cases.

g. Wind the clock (fig. 11).

h. Inspect the shelter for proper support and installation. Check the exterior surfaces for rust, corrosion, punctures, or cuts.

i. Check the entrance boxes, exhaust blower vents, and air filter cover for cracks, leaks, damaged gaskets, dirt, and grease.

j. Check for normal operation (par. 48).

47. Monthly Preventive Maintenance and Lubrication

a. Lubricate the door locks and latches. Use grease (GGA).

b. Lubricate the door hinges and the hinges on the entrance box covers, exhaust blower vent covers, and air filter cover. Use oil (PL special) or oil (OE-10).

c. Lubricate all metal-to-metal moving parts.

d. Lubricate the major components as described in the appropriate technical manual (app. I).

Caution: **More frequent lubrication may be required in excessively hot, humid, or dusty areas. Do not overlubricate.**

e. Remove the shelter air filter and soak it in cleaning compound, benzine, or naphtha. Shake loose dirt from the air filter, air-dry it, and replace it in its mountings.

f. Inspect the fire extinguishers (fig. 12) for broken wire seals on the trigger mechanisms. If the extinguisher has been used, or if there are signs of leakage, request that it be recharged.

48. Equipment Performance Checklist

This checklist is used to systematically check the ac circuits of the S–189/MSC after the shelter has been connected to the power source (par. 28). Only the first echelon maintenance corrective measures are given in the *Corrective measures* column. If the corrective measures given do not correct the fault, request higher echelon maintenance. When using the checklist, start at the beginning and follow each step consecutively. If the trouble is suspected to be in a particular area, start checking at that point and continue the steps sequentially. Refer to the power schematic-wiring diagram (fig. 56) when checking circuits. When a fault or trouble is located in a major component, refer to the applicable technical manual (app. I). First echelon repair procedures are given in paragraphs 50 through 58.

	Item No.	Item	Action or condition	Normal indications	Corrective measures
PRE	1	All shelter and component switches and controls.	Operate to OFF	POWER INDICATOR NEON LAMP remains on.	Replace POWER INDICATOR NEON LAMP (par. 50*c*).
P	2	MAIN circuit breaker (fig. 19)	Operate to ON.		
A	3	Voltmeter (fig. 19)	Use hand lantern and read the meter.	Voltmeter indicates 115 volts + 10.	Reset MAIN circuit breaker to OFF and then to ON. Check ac power at the source (par. 28). Check the power cable assembly and replace.
R A T O R Y	4	Ammeter (fig. 19)	Use hand lantern and read the meter.	Ammeter indicates 0	Check to see that all other circuit breakers on the power distribution panel are at OFF.
	5	Circuit breaker No. (fig. 19): 1 LIGHTS	Operate to ON	Glowlamp above circuit breaker lights.	Replace glowlamp (par. 50*c*).
			Operate LIGHT 1, and LIGHT 2 (fig. 12) and LIGHT 3, and LIGHT 4 (fig. 14) switches to ON.	Fluorescent lights go on	Reset circuit breaker No. 1 to OFF and then to ON. If some, but not all of lights fail to go on, replace faulty lamp or starter (par. 50*a* and *b*).

	Item No.	Item	Action or condition	Normal indications	Corrective measures
PREPARATORY			Release door microswitch by opening door.	Fluorescent lights go out. POWER INDICATOR NEON LAMP remains on.	Replace POWER INDICATOR NEON LAMP (par. 50*c*).
			Operate BLACKOUT BYPASS switch to ON (fig. 12).	Fluorescent lights go on.	
		2 BLOWERS	Operate to ON	Glowlamp above circuit breaker lights.	Replace glowlamp (par. 50*c*).
			Operate BLOWER 1 switch (fig. 10) to ON.	Ammeter indicates approximately 3 amperes. BLOWER 1 operates.	Clean and replace blower cover (par. 52).
			Repeat procedures listed above for BLOWER 2 (fig. 9).		
		3 HEATER 1	Operate to ON	Glowlamp above circuit breaker lights.	Replace glowlamp (par. 50*c*).
			Operate heater HEAT-OFF-FAN switch (fig. 21) HEAT. Opeate TEMPERATURE CONTROL to desired position.	Ammeter indicates above 16 amperes. Warm air is blown from front of heater. When temperature rises to thermostat temperature setting, heat will be cut off.	Press heater RESET button.
			Operate heater HEAT-OFF-FAN switch to FAN.	Air (at room temperature) is blown from front of heater.	
		6 HEATER 2	Repeat the procedures as for HEATER 1.		
		4 CONVENIENCE	Operate to ON	Glowlamp above circuit breaker lights.	Replace glowlamp (par. 50*c*). If *all* components connected at CONVENIENCE receptacles do not operate, reset circuit breaker No. 4. If components still fail to operate, disconnect the power cords (one at a time) to determine if component is at fault.
		5 EQUIPMENT	Operate to ON	Glowlamp above circuit breaker lights.	Replace glowlamp (par. 50*c*). If *all* components connected at EQUIPMENT receptacles do not operate, reset circuit breaker No. 5. If components still fail to operate, disconnect the power cords (one at a time) to determine if component is at fault.
			Operate TT–4A/TG–TH-5/TG ON-OFF switch to ON (fig. 26).	Glowlamp above switch lights.	Replace glowlamp (par. 50*c*).
			Operate 20 cycle RINGING switch to ON (fig. 22).	Glowlamp above switch lights.	Replace glowlamp (par. 50*c*).

	Item No.	Item	Action or condition	Normal indications	Corrective measures
EQUIP.	6	Major components	Operate components as described in appropriate technical manuals (app. I). Perform patching as required (pars. 39 and 40).		Replace defective component, when possible, with one known to be in good condition (pars. 54 through 58).
PERFORMANCE	7	Shelter components	Operate components as described in paragraph 38.		Replace defective components, when possible, with one known to be in good condition (pars. 51 through 53).
STOP	8	Major components	Perform stopping procedures described in appropriate technical manuals (appx I).		
	9	Shelter components	Perform stopping procedures described in paragraph 41.		

49. Replacement of Hand Lantern Batteries and Bulb

(fig. 42)

The hand lantern requires four Batteries BA–30 for operation. A spare bulb is stored inside the reflector case.

a. Replacing Batteries.

(1) Pull the battery case latch forward and raise the battery case cover.

(2) Insert four batteries in the case, with the center brass caps *up*.

(3) Snap the battery case cover shut.

b. Replacing Bulb.

(1) Press the button on the bottom of the reflector case and lift out the reflector.

(2) Unscrew the brass cap on the rear of the bulb and remove the bulb and spring.

(3) Remove the spare bulb from inside the reflector case. Insert the bulb and spring in the reflector and tighten the brass cap.

(4) Replace the reflector in the reflector case and snap it securely in position.

50. Removal and Replacement of Lamps and Fluorescent Lamp Starters

a. Fluorescent Lamp.

(1) Pull gently on the ends of the light shield to remove it from the fluorescent light fixture.

(2) Rotate the lamp in its sockets ¼ turn and remove it from fixture.

(3) Remove a spare lamp from the ceiling storage bracket (fig. 14).

(4) Align the lamp pins with the slots in the fixture sockets.

(5) Press in and rotate the lamp ¼ turn to seat the pins.

(6) Place the clips on each end of the light shield over the fixture sockets; gently press the light shield in place.

b. Fluorescent Lamp Starter.

(1) Remove the light shield and the lamp (*a*(1) and (2) above).

(2) Press in and twist the starter ¼ turn counterclockwise and withdraw it.

(3) Remove a spare starter from the ceiling storage bracket (fig. 14). Insert the new starter; press in and twist it clockwise until it seats.

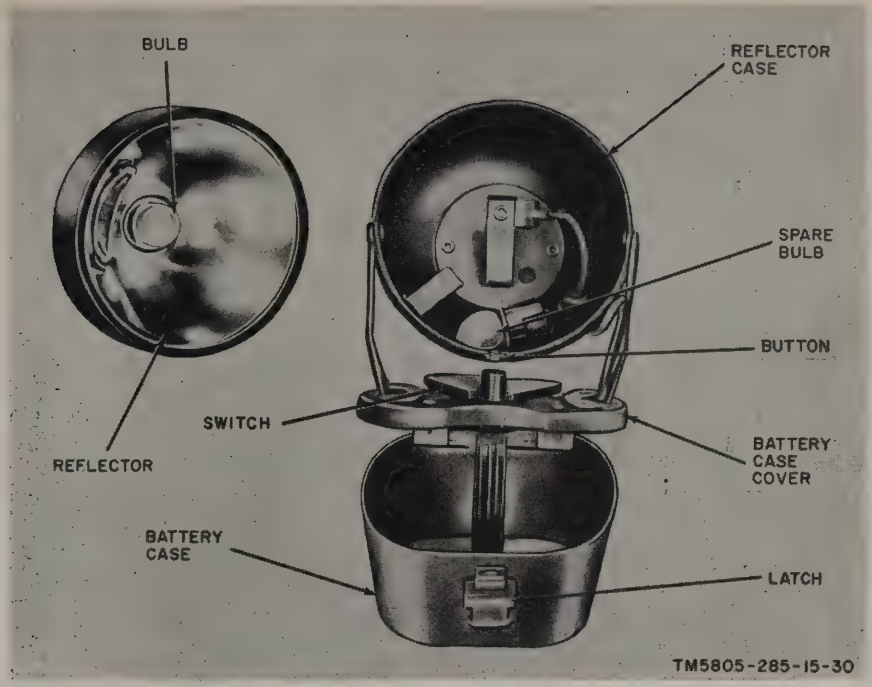


Figure 42. Hand lantern, partially disassembled.

(4) Replace the lamp and the light shield (*a*(4) through (6) above).

c. Neon and Incandescent Lamps. To remove a defective neon or incandescent lamp, unscrew it from its socket.

51. Removal and Replacement of Electric Heater (fig. 21)

a. Removal.

(1) Operate the HEAT-OFF-FAN switch to OFF.

(2) Remove the power cord connector from the HEATER receptacle (figs. 9 and 10).

(3) Loosen the four turnlock fasteners that secure the heater to the mounting base.

(4) Unscrew and remove the mounting base knob.

(5) Slide the heater toward the right until it clears the flange on the mounting base, and lift out the heater.

b. Replacement.

(1) Slide the heater onto the mounting base so that it engages the flange.

(2) Tighten the four turnlock fasteners.

(3) Replace and tighten the mounting base knob.

52. Removal and Replacement Exhaust Blower Cover

a. Removal.

(1) Operate the applicable BLOWER switch to OFF (figs. 9 and 10).

(2) Disconnect the power cord connector from the BLOWER receptacle.

(3) Remove the 10 screws that secure the cover to the front wall, and lift off the cover.

b. Replacement. Replace the cover. The sequence for the replacement is the reverse of the removal sequence.

53. Removal and Replacement of Intercom Panel (fig. 22)

a. Removal.

(1) Disconnect the ac power cord connectors from the power receptacle box at the rear of patch panel C.

(2) Disconnect the white-yellow-black and white-yellow-violet wires from the

binding posts on the rear of the LS–147D/FI.

(3) Disconnect the white-red-brown and white-gray-brown wires from the TA–24A/TT terminals.

(4) Remove the four panel mounting screws and lift out the intercom panel.

b. Replacement. Replace the intercom panel. The sequence for the replacement is the reverse of the removal sequence.

54. Removal and Replacement of TA–312/PT

(fig. 30)

a. Removal.

(1) Remove the prepared leads on the telephone connecting cord from the TA–312/PT LINE binding posts.

(2) Loosen the wingnut on the side of the mounting bracket and rotate the clamping arm upward.

(3) Remove the flathead screw on the side of the mounting bracket.

(4) Slide the TA–312/PT out of the mounting bracket and remove the holding plate from the buzzer recess on the side of the TA–312/PT.

b. Replacement.

(1) Remove the replacement TA–312/PT from its carrying case and insert the holding plate in the buzzer recess.

(2) Place the TA–312/PT in the mounting bracket. Replace and tighten the flathead screw.

(3) Position the clamping arm and tighten the wingnut.

(4) Connect the prepared leads of the telephone connecting cord to the LINE binding posts.

55. Removal and Replacement of TH–5/TG

a. Removal.

(1) Disconnect the TT–4A/TG cords from the jacks on the TH–5/TG.

(2) Disconnect the power cord connector from the receptacle in the TT–4A/TG –TH–5/TG switchbox. Disconnect all wires from the front panel and chasis of the TH–5/TG.

(3) Loosen the captive screws on the front panel; pull the chassis forward and lift it from its rack.

b. Replacement. Replace the TH–5/TG. The sequence for the replacement is the reverse of the removal sequence.

56. Removal and Replacement of TT–4A/TG

a. Removal.

(1) Operate the TT–4A/TG MOTOR switch and LIGHT switch to OFF.

(2) Remove the power cord connector from the TT–4A/TG–TH–5/TG switchbox.

(3) Loosen the web strap across the top of the dust cover and remove the dust cover.

(4) Remove the connecting cords from the binding posts on the TT–4A/TG.

(5) Loosen the four wingnuts beneath the tabletop. Remove the retaining bars and lift the TT–4A/TG from the tabletop.

b. Replacement.

(1) Remove the immersionproof cover of the replacement TT–4A/TG (if applicable).

(2) Replace the TT–4A/TG. The sequence for the replacement is the reverse of the removal sequence.

57. Removal and Replacement of SB–22/PT

a. Removal.

(1) Disconnect all wires from the binding posts at the rear of the SB–22/PT.

(2) Remove the four BA–30's from the battery compartment in the SB–22/PT.

(3) Loosen the wingnuts on the retaining bar of the rack mounting, and raise the retaining bar.

(4) Slide the SB–22/PT out from the mounting rack.

b. Replacement. Replace the SB–22/PT. The sequence for the replacement is the reverse of the removal sequence.

58. Removal and Replacement of Test Equipment

a. Removal of TS–140/PCM. Remove the SG–15A/PCM or the ME–22A/PCM as follows:

(1) Disconnect the power cord plug from the equipment receptacle in the power duct.
(2) Disconnect the patch cords from the front panel of the unit.
(3) Remove the four mounting screws that secure the front panel of the unit to the patch panel.
(4) Slide the unit forward onto the tabletop and remove it from the patch panel.

b. Replacement of TS–140/PCM. Replace the unit. The sequence for the replacement is the reverse of the removal sequence.

c. Removal of VOLT-OHM METER.
(1) Disconnect the test probes from the VOLT-OHM METER pin jacks. (fig. 28).
(2) Remove the two mounting bolts that secure the bottom holding plate beneath the VOLT-OHM METER.
(3) Pull the VOLT-OHM METER out from the bottom of its mounting bracket.

d. Replacement of VOLT-OHM METER. Replace the VOLT-OHM METER. The sequence for the replacement is the reverse of the removal sequence.

Section II. ORGANIZATIONAL, FIELD AND DEPOT MAINTENANCE

Note. The maintenance allocation chart (app. II) indicates the maintenance functions and tools authorized for each maintenance echelon.

59. Troubleshooting Information

a. Procedures for localizing troubles within the SB–675/MSC are given in the equipment performance checklist (par. 48).

b. Procedures for troubleshooting components, parts, and wiring of the S–189/MSC are given in paragraph 60.

c. Procedures for troubleshooting major components of the SB–675/MSC are given in the appropriate technical manuals (app. I). Refer to paragraphs 54 through 58 for removal and replacement of major components.

60. Troubleshooting and Repair Procedures

Warning: **Be extremely careful when performing troubleshooting procedures; dangerous voltages are present in the equipment.**

Isolate defective components, parts, or wiring of the S–189/MSC by making appropriate voltage, resistance, or continuity tests. Use the VOLT-OHM METER, when practical, or Multimeter AN/URM–105. The SG–15A/PCM and ME–22A/PCM can be used to isolate trouble in the signal circuits. Use figure 56 when isolating trouble in the power circuits; and figure 55 for signal circuits. Repair or replace the components, parts, or wiring as authorized in the maintenance allocation chart. Refer to the chart below for references to repair procedures.

Part or component	References
Ammeter	Par. 63*d*, figs. 47 and 56.
Circuit breaker No. 1 through 6	Par. 63*b*, figs. 47 and 56.
Current transformer	Par. 63*c*, figs. 47 and 56.
Door microswitch	Par. 65*b*, figs. 12 and 56.
Electric heater	Par. 61, figs. 43 and 44.
Exhaust blower	Par. 62, figs. 45 and 46.
Fluorescent light fixture	Par. 66, figs. 52 and 56.
Hybrid transformer	Par. 68, fig. 55.
Intercommunication Station LS–147D/FI	Par. 69, figs. 22 and 53.
MAIN circuit breaker switch	Par. 63*a*, figs. 47 and 56.
Power duct switches	Par. 65*a*, figs. 12, 14, and 56.
Shelter	Par. 70.
Static Ring Generator TA–248/TT	Pars. 65*c*(2) and 67, figs. 55 and 56.
Toggle switches:	Par. 65*c*, fig. 56.
TT–4A/TG–TH–5/TG switch panel	Par. 65*c*(1), fig. 50.
2W–4W switch	Par. 65*d*, fig. 51.
26–pair receptacle	Par. 64, figs. 48 and 49.

61. Electric Heater Repairs
(figs. 43 and 44)

a. Preliminary Procedures. Remove the heater from its mounting base (par. 51) and remove the backplate and bottom plate as described in (1) through (4) below.

(1) Remove the four screws that secure the bottom plate to the heater.
(2) Remove the two screws that secure the backplate to the bottom plate and remove the bottom plate.
(3) Loosen the power cord clamp on the backplate.
(4) Remove the four screws that secure the backplate to the heater and remove the backplate.

b. Removal and Replacement of Power Cord.

(1) Loosen the screws that secure the power cord leads to the terminal board.
(2) Pull the power cord out of the clamp in the backplate.
(3) Insert a new power cord through the clamp in the backplate.
(4) Connect the leads to the terminal board.

c. Removal and Replacement of Temperature Control Unit.

(1) Loosen the screws that connect the two wires to the temperature control unit.
(2) Remove the two screws that secure the unit to the cabinet and remove the unit.
(3) Insert the TEMPERATURE CONTROL switch on the replacement unit through the slot in the cabinet. Replace and tighten the screws.
(4) Connect the two wires to the temperature control unit.

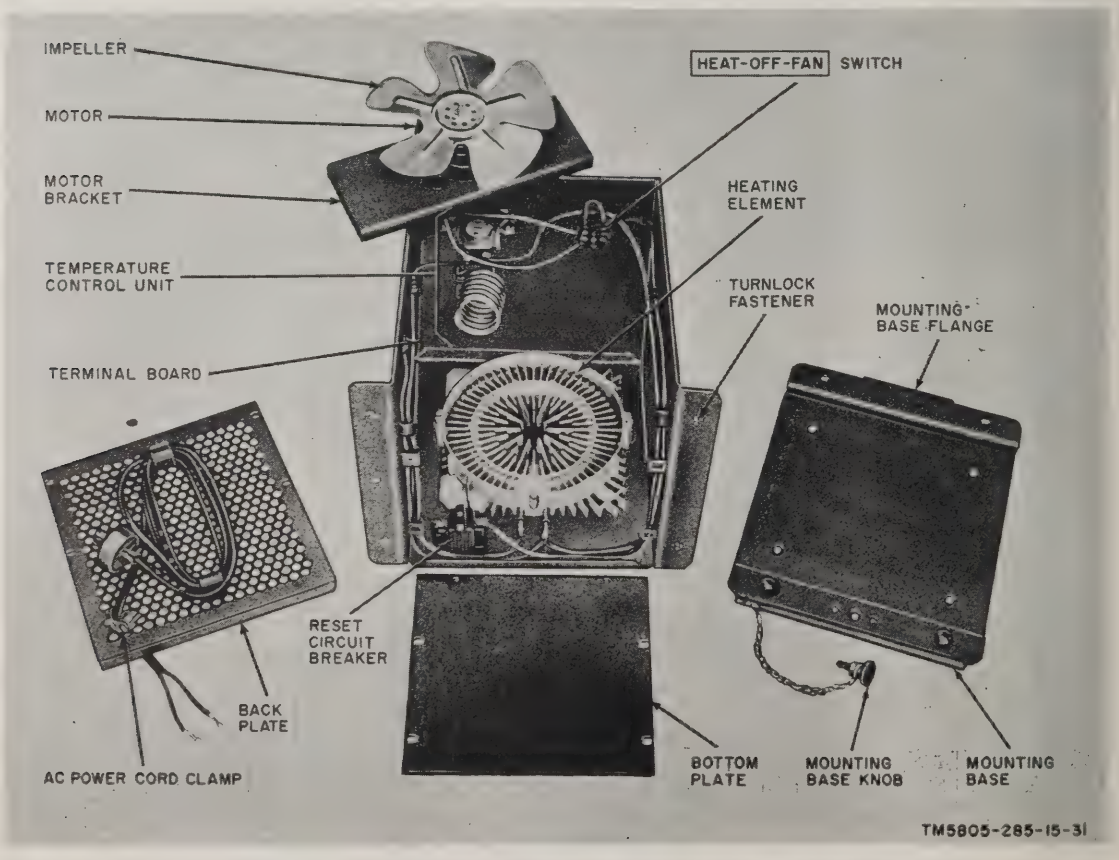


Figure 43. Electric heater, rear view, partially disassembled.

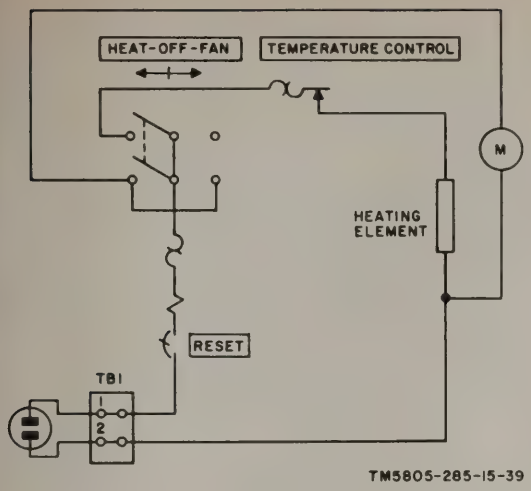


Figure 44. Electric heater, schematic diagram.

d. Removal and Replacement of HEAT-OFF-FAN Switch.

(1) Unsolder the three wires and strap connected to the switch.

(2) Remove the ringnut that secures the switch to the cabinet and remove the switch.

(3) Solder the strap and three wires to the replacement switch.

(4) Position the switch and tighten the ringnut.

e. Removal and Replacement of Reset Circuit Breaker.

(1) Loosen the screws that connect the two insulated wires to the circuit breaker. Loosen the bolt that secures the bare copper wire to the heating element.

(2) Remove the two screws that fasten the circuit breaker to the cabinet and remove the circuit breaker.

(3) Connect the two insulated wires to the replacement circuit breaker. Connect the bare copper wire to the heating element.

Caution: **Do not alter the shape or length of the bare copper wire.**

(4) Insert the circuit breaker and replace and tighten the screws.

f. Removal and Replacement of Motor and Impeller.

(1) Remove the four screws that secure the motor bracket to the cabinet and lift out the bracket and motor.

(2) Disconnect the motor leads at the HEAT-OFF-FAN switch and at the taped splice in the heating element cable.

(3) Remove the three screws that secure the motor to the bracket.

(4) Unscrew the metal fastener that secures the impeller to the motor shaft and remove the impeller.

(5) Position and secure a replacement motor in the bracket. Slide the impeller into the motor shaft and tighten the fastener.

(6) Replace the motor bracket in the cabinet and connect the motor leads ((2) above).

g. Removal and Replacement of Heating Element.

(1) Remove the four screws that secure the motor bracket to the cabinet and remove the motor bracket.

(2) Loosen the bolt that secures the bare copper wire from the circuit breaker to the heating element and remove the wire.

Caution: **Be extremely careful when removing this lead. Do not alter the length or shape of the bare copper wire.**

(3) Remove the wire connectors from the plug-in terminals on the heating element.

(4) Remove the screws that secure the heating element to the cabinet. Be careful not to bend the louvers on the front of the cabinet during the removal procedure.

(5) Position the replacement element and replace and tighten the screws.

(6) Connect the wires to the plug-in terminals of the heating element.

(7) Replace the bare wire connected from the circuit breaker ((2) above).

(8) Position the motor bracket in the cabinet and replace and tighten the screws.

62. Exhaust Blower Repairs

(figs. 45 and 46)

a. Preliminary Procedures. Remove the exhaust blower cover (par. 52) and remove the

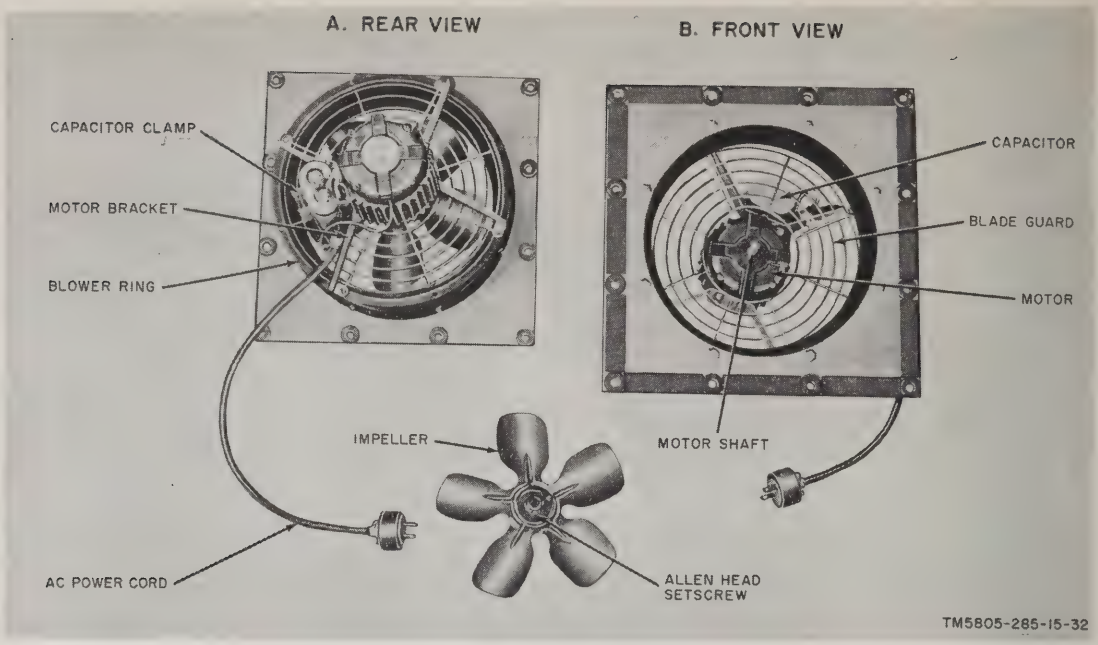


Figure 45. Exhaust blower, front and rear view.

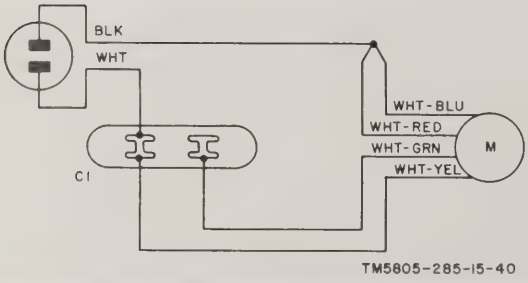


Figure 46. Exhaust blower, schematic-wiring diagram.

power cord plug from the receptacle (figs. 9 and 10).

b. Removal and Replacement of Capacitor.

(1) Loosen the capacitor clamp screw.
(2) Remove the power cord clamp from the motor bracket.
(3) Slide the capacitor out of the clamp.
(4) Disconnect the motor leads and the power cord from the capacitor terminals.
(5) Connect the motor leads and the power cord to the replacement capacitor terminals.
(6) Slide the capacitor into the clamp and tighten the screw.
(7) Replace the power cord clamp.

c. Removal and Replacement of Power Cord.

(1) Remove the capacitor from the clamp (*b*(2)–(4) above).
(2) Disconnect the power cord leads from the capacitor and motor leads.
(3) Connect the new power cord to the capacitor and motor leads.
(4) Slide the capacitor into the clamp and tighten the screw.
(5) Replace the power cord clamp.

d. Removal and Replacement of Motor and Impeller.

(1) Remove the two screws from the bottom edge of the plate that holds the exhaust blower to the front wall. Lift off the blower.
(2) Remove the four bolts that secure the blade guard and motor bracket to the blower ring.
(3) Disconnect the motor leads from the capacitor and the power cord.
(4) Remove the power cord clamp.
(5) Remove the four screws that secure the motor mounting bracket to the motor.
(6) Loosen the two Allen-head setscrews that secure the impeller to the motor shaft and remove the impeller.

(7) Slide the impeller (setscrews toward the motor) onto the shaft of the new motor and tighten the setscrews.
(8) Secure the motor bracket to the new motor.
(9) Connect the motor leads to the capacitor and the power cord.
(10) Replace the power cord clamp.
(11) Position the motor brackets and blade guard on the blower ring.
(12) Replace and tighten the bolts that secure the motor bracket and blade guard to the blower.
(13) Replace the exhaust blower. The sequence for replacement is the reverse of the removal sequence ((1) above).
(14) Replace the exhaust blower cover (par. 52).

63. Power Distribution Panel Repairs (fig. 47)

a. Preliminary Procedures. Operate the MAIN circuit breaker to OFF and disconnect the power cable at the power and signal entrance box (fig. 15). Remove the four screws that secure the cover to the power distribution panel and remove the cover.

b. Removal and Replacement of Circuit Breaker.

(1) Grasp the defective circuit breaker and pull it straight out from the panel.
(2) Tag and disconnect the wires connected to the circuit breaker.
(3) Connect the wires ((2) above) to the replacement circuit breaker and firmly press it back into the panel.

c. Removal and Replacement of Current Transformer.

(1) Remove the four screws that secure the meter panel to the power distribution panel.
(2) Tag and disconnect the current transformer leads from the ammeter.
(3) Remove the two bolts that secure the current transformer inside the panel and remove the current transformer.

Note. Count the number of turns of heavy black wire around the current transformer before proceding with the next step.

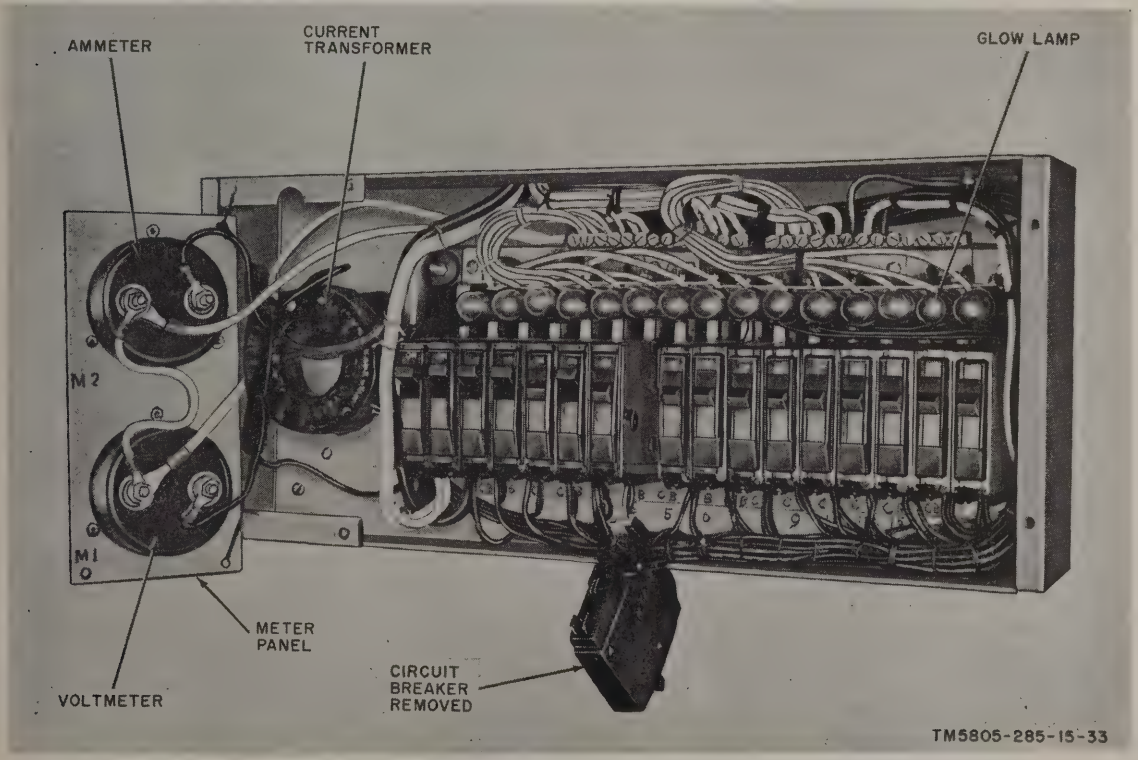


Figure 47. Typical power distribution panel, meter panel and circuit breaker removed.

(4) Disconnect the black wire wound around the current transformer from the MAIN circuit breaker and carefully unwind the wire from the current transformer.

(5) Wind the black wire around the replacement transformer.

Caution: **Be sure that the number of turns is the same as on the original transformer. Reconnect the black wire to the MAIN circuit breaker (fig. 47).**

(6) Position the replacement transformer inside the panel and replace and tighten the bolts.

(7) Connect the transformer leads to the ammeter.

(8) Replace the meter panel and tighten the screws.

d. Removal and Replacement of Meters.

(1) Remove the bolts that hold the meter to the meter panel and lift out the meter.

(2) Tag and disconnect the leads from the meter terminals.

(3) Connect the leads to the replacement meter.

(4) Position the meter in the panel and tighten the bolts.

64. Removal and Replacement of 26–Pair Receptacle Insert (figs. 48 and 49)

a. Removal.

(1) Remove the screws that secure the cover to the connector signal entrance panel and remove the cover.

(2) Remove the four screws that secure the insert clips (fig. 49).

(3) Unfasten the cable clip nearest the defective 26-pair receptacle mounting (fig. 49).

(4) At the connector signal entrance box, remove the 26-pair receptacle cover.

(5) Lift the receptacle insert out from the front of the 26-pair receptacle housing.

(6) Unsolder the wires from the receptacle insert.

b. Replacement.

(1) Connect the cable to the replacement insert (fig. 49).

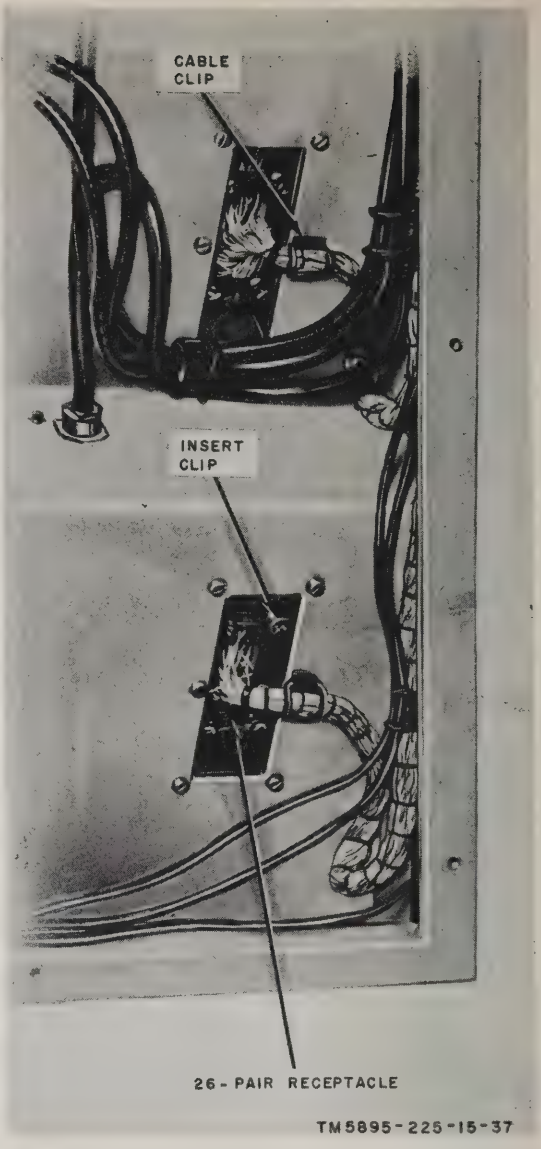


Figure 48. Part of connector signal entrance box, rear view.

Caution: **Be extremely careful when connecting and soldering wires. Excessive heat or pressure will damage the insert.**

(2) Carefully place the insert in the 26-pair receptacle housing (fig. 49).

Caution: **Be careful not to damage the wires when taking up slack in the 26-pair cable or when replacing the insert mounting screws.**

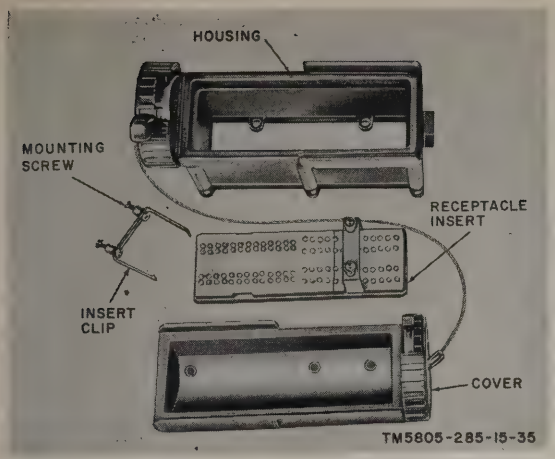


Figure 49. 26-pair receptacle, partially disassembled.

(3) Replace the four screws that secure the insert to the 26-pair receptacle housing.
(4) Secure the cable form under the cable clip (fig. 48).
(5) Replace the connector signal entrance panel cover and tighten the screws.
(6) Replace the 26-pair receptacle cover (par. 33*a*).

65. Removal and Replacement of Switches

a. Power Duct Switches.
(1) Operate the appropriate circuit breaker to OFF.
(2) Remove the screws from the brackets at each end of the switch. Remove the two brackets and the switchplate.
(3) Remove the switch mounting screws and the switch.
(4) Remove the wires from the switch and connect the wires to the replacement switch.
(5) Replace the switch. The sequence for the replacement is the reverse of the removal sequence.

b. Door Microswitch.
(1) Operate LIGHTS circuit breaker No. 1 to OFF.
(2) Remove the signal duct cover between the POWER INDICATOR NEON LAMP and the LIGHT 1 switch (fig. 12).
(3) Tag and remove the wires from the NO and C terminals of the switch.
(4) Unscrew the ringnut from the door side of the switch and remove the switch.
(5) Replace the switch. The sequence for the replacement is the reverse of the removal sequence.

c. Toggle Switches.
(1) *TT–4A/TG–TH–5/TG switchbox.*
(*a*) Remove the power cord connector from the CONVENIENCE receptacle.
(*b*) Remove the screws from the housing of the switchbox and lift off the housing.
(*c*) Unscrew the hexagonal nut and remove the power switch.
(*d*) Disconnect the wires from the switch.
(*e*) Connect the wires to the replacement switch (fig. 50).
(*f*) Replace the switch. The sequence for the replacement is the reverse of the removal sequence.

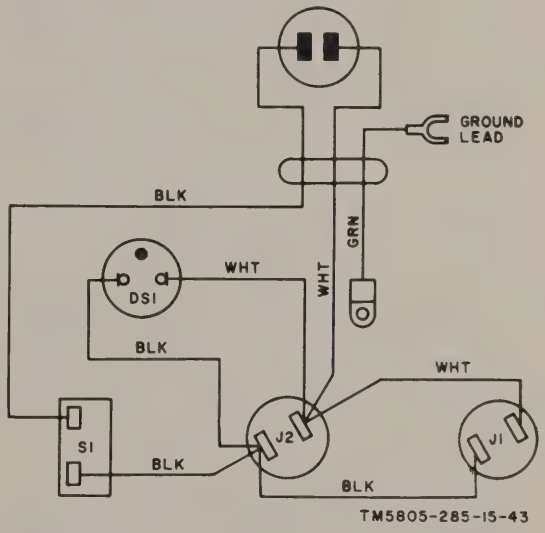


Figure 50. TT–4A/TG–TH–5/TG switchbox, wiring diagram.

(2) *TA–248/TT 20 ~ RINGING switch.*
(*a*) Remove the TA–248/TT power cord connector from the power receptacle box at the rear of patch panel C.
(*b*) Remove the two screws that secure the power receptacle box cover.
(*c*) Remove the power receptacle box cover to expose the connections at

the rear of the 20 ~ RINGING switch.

(*d*) Remove the hexagonal nut that holds the 20 ~ RINGING switch to the intercom panel.

(*e*) Tag and remove the wires from the switch and withdraw the switch from the intercom panel.

(*f*) Connect the wires to the replacement switch.

(*g*) Replace the switch. The sequence for the replacement is the reverse of the removal sequence.

d. 2W–4W Control Switch.

(1) Remove the screw that holds the knob to the control and remove the knob.

(2) Remove the screws on the front panel and lift off the panel.

(3) Tag and unsolder the leads connected to the control.

(4) Remove the locknut and replace the control.

(5) Solder the leads to the control (fig. 51).

(6) Replace the front panel and control knob.

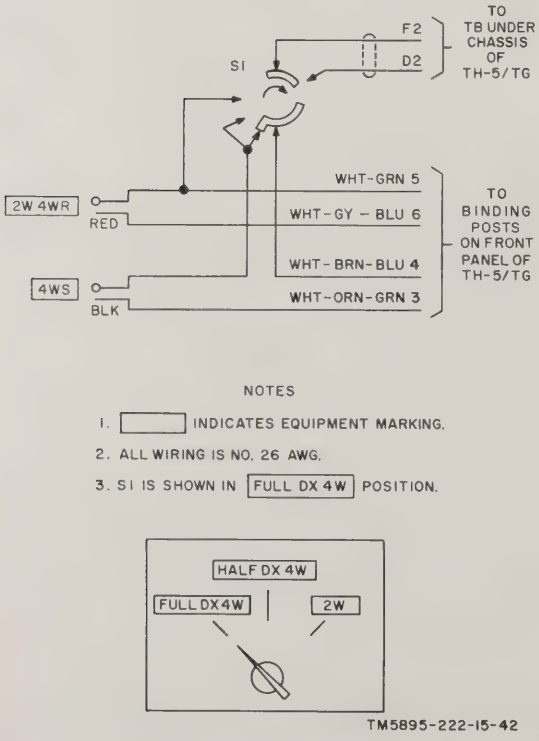


Figure 51. 2W–4W switch, schematic-wiring diagram.

66. Removal and Replacement of Fluorescent Light Fixture Components

Note. The fluorescent light fixtures are fabricated as part of the ceiling power duct. The radio frequency (rf) filters are sealed units and cannot be repaired. They are replaced as a complete unit.

a. Remove the light shield and the fluorescent lamp (par. 50*a*).

b. Carefully pry off the cover from the power duct.

c. Tag and disconnect the wires from the defective component; remove the component from the power duct.

d. Secure the replacement component in the power duct (fig. 52).

e. Connect the wires to the replacement component (fig. 52).

f. Replace the cover on the power duct.

g. Replace the fluorescent lamp and light shield (par. 50).

67. Removal and Replacement of TA–248/TT

a. Disconnect the power cord connector of TA–248/TT from the power receptacle box on the rear of patch panel C.

b. Disconnect the insulated cable (from the TA–248/TT) that is connected at the terminal board on the rear of the patch panel.

c. Remove the three screws that hold the TA–248/TT to the rear of the tabletop and remove the TT–248/TT.

d. Replace the TA–248/TT. The sequence for the replacement of the TA–248/TT is the reverse of the removal procedures.

68. Removal and Replacement of Hybrid Transformer

a. At the rear of patch panels A and B, remove the two mounting screws and loosen the locknuts that secure the hybrid transformer panel to the rack.

b. Tag and unsolder the wires from the terminals on the defective hybrid transformer.

c. Remove the two nuts that hold the hybrid transformer to the panel.

d. Replace the hybrid transformer and the panel. The sequence for the replacement is the reverse of the removal sequence.

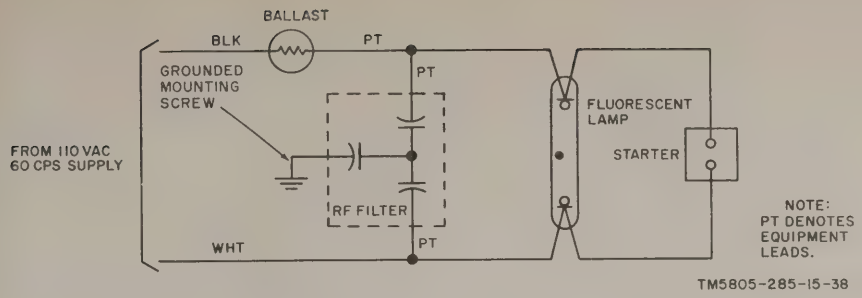


Figure 52. Fluorescent light fixture, schematic-wiring diagram.

69. Removal and Replacement of LS–147D/FI

Replace the defective LS–147D/FI at the intercom panel with a chassis removed from the case of a replacement LS–147D/FI (*b* below). Install the defective LS–147D/FI chassis in the empty case of the replacement unit and attach the appropriate repair tag.

a. Removal of Defective Chassis From Intercom Panel.

(1) Disconnect the power cord connector from the power receptacle box; disconnect the wires from the binding posts at the rear of the unit.

(2) Loosen the screws and remove the backplate from the dust cover at the rear of the intercom panel.

(3) Remove the four screws on the bottom of the dust cover that hold the chassis.

(4) Loosen the setscrews on the three control knobs at the front of the intercom panel and remove the control knobs.

(5) Slide the chassis part way out of the dust cover.

(6) Loosen the screw and remove the glowlamp socket from the mounting bracket on the rear of the intercom panel.

(7) Loosen the four locknuts that secure the loudspeaker to the bracket on the rear of the intercom panel.

Caution: **Do not disturb the glowlamp and loudspeaker connections at the chassis.**

(8) Withdraw the chassis from the dust cover.

b. Removal of Replacement Chassis From Case.

(1) Remove the case backplate, the four chassis screws, and the control knobs (*a*(2)–(4) above).

(2) Remove the chassis from the case.

(3) Remove the retaining nuts on the controls that hold the loudspeaker panel to the front of the chassis.

(4) Remove the loudspeaker panel from the chassis.

Caution: **Do not disturb the glowlamp and loudspeaker connections.**

(5) Remove the glowlamp socket and loudspeaker from the loudspeaker panel.

(6) Replace the empty loudspeaker panel and tighten the retaining nuts ((3) above).

c. Replacement of Chassis.

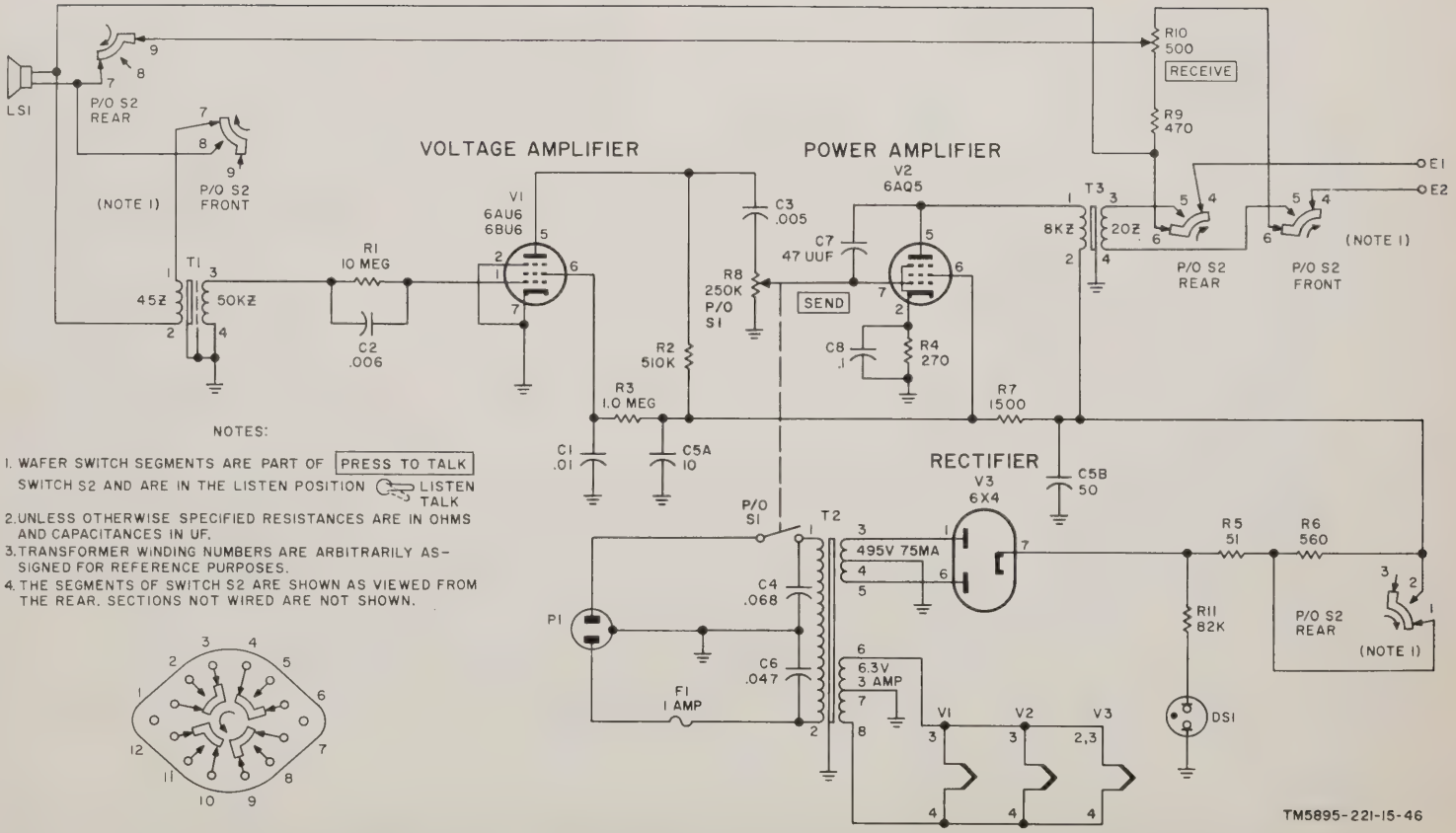
(1) Install the replacement chassis in the intercom panel. The sequence for the replacement is the reverse of the removal sequence (*a* above).

(2) Install the defective chassis in the empty case of the replacement unit and attach the repair tag. The sequence for the replacement is the reverse of the removal sequence (*b* above).

70. Shelter Maintenance

a. The maintenance and replacement of the S–189/MSC racks, frames, brackets, and assorted hardware is accomplished by removing and replacing screws or bolts. When any exterior component of the shelter is replaced, be sure that the gasket is adequately sealed to the shelter to prevent leakage. The responsibilities for shelter maintenance are listed in the maintenance allocation chart (app. II).

b. The exterior skin of the shelter is susceptible to puncturing or gouging during loading and transportation. Use Patch Kit, Shelter,



NOTES:

1. WAFER SWITCH SEGMENTS ARE PART OF PRESS TO TALK SWITCH S2 AND ARE IN THE LISTEN POSITION (LISTEN / TALK)
2. UNLESS OTHERWISE SPECIFIED RESISTANCES ARE IN OHMS AND CAPACITANCES IN UF.
3. TRANSFORMER WINDING NUMBERS ARE ARBITRARILY ASSIGNED FOR REFERENCE PURPOSES.
4. THE SEGMENTS OF SWITCH S2 ARE SHOWN AS VIEWED FROM THE REAR. SECTIONS NOT WIRED ARE NOT SHOWN.

Figure 53. Intercommunication Station LS–147D/FI, schematic diagram.

Electrical Equipment (Federal stock No. 5410–783–6250) to repair the roof or sides of the shelter as described in the instructions provided with the patch kit and given below.

(1) Use emery cloth, sandpaper, a knife, or scraper and remove all paint or foreign matter within a 3-inch radius around the hole to be patched. Do not touch the cleaned area with your hands or oily rags.

(2) If the insulation has been gouged out, fill the hole with clean noncombustible material, if possible. *Do not use the glass cloth for this purpose.*

(3) Cut out a piece of glass cloth that will extend 2 inches beyond the edges of the hole to be repaired.

Warning: **Resin No. 797 and curing agent No. 237 are harmful to the skin. Wash thoroughly with water any area of the body that may have come in contact with the liquid resin or curing agent.**

(4) Pour 3 ounces of resin No. 797 for each square foot of surface area to be covered into the mixing cup provided. Shake the can thoroughly before pouring out the resin. Temperature and climate will determine the quantity of curing agent and cold weather promoter to be added to the resin. Use the eye dropper provided and prepare the mixture as follows:

(*a*) For temperatures above 55° F., fill the eye dropper to the red line with curing agent No. 237. Add the curing agent to the resin and mix thoroughly.

(*b*) For temperatures between 20° and 55° F., fill the eye dropper to the red line with curing agent No. 237; add the curing agent to the resin and mix thoroughly. Fill the eye dropper to the half-way mark with cold weather promoter No. 347. Add the cold weather promoter to the combined curing agent and resin and mix thoroughly.

(*c*) For temperatures below 20° F., fill the eye dropper to the red line with curing agent No. 237; add the curing agent to the resin and mix thoroughly. Fill the eye dropper to the red line with cold weather promoter No. 347. Add the cold weather promoter to the combined curing agent and resin and mix thoroughly.

(5) Use the spatula (or the brush in hard-to-reach areas or when temperature is above 55° F.) and spread a liberal coating of the prepared mixture over the surface to be patched. Place the glass cloth ((3) above) over the coating and press it lightly with the applicator. Spread a second liberal coating of the mixture over the glass cloth; work from the center of the patch toward the edges.

(6) Examine the patch to see that the edges are flat and firmly embedded in the mixture. Be sure that the patch is *completely* covered by the mixture. Prepare and apply an additional mixture, if necessary.

Note. To accelerate low temperature curing, heat the patch with warm dry air or radiant heat. *Do not use an open flame or warm liquid!*

(7) Depending on the temperature and drying conditions, the patched surface may be sanded and painted within 4 to 24 hours after application. After the mixture in the cup and on the spatula has hardened, flex them with your fingers to crack the mixture. Clean the cup and spatula and store them for future use. Discard the used brushes and recap and store the containers.

Caution: **Recap the containers tightly and store them in a *cool* dry place.**

CHAPTER 5

THEORY

71. General

The SB–675/MSC contains facilities for terminating and patching 936 lines and for terminating and patching 12 circuits (trunk and local) with a minimum of interruption in service. Testing and monitoring facilities provide for locating troubles in the line and trunk circuits. All signal connections are made in the connector signal entrance boxes or the binding post signal entrance box on the outside of the shelter; power connections are made in the power and signal entrance box.

72. Signal Circuits

(fig. 55)

a. 26-Pair Receptacle Circuits.

(1) *Pairs 1 through 24.* Pairs 1 through 24 of each *odd-numbered* 26-pair receptacle (except SIGNAL 23) are wired to a corresponding IN jack. Each IN jack is wired through to a corresponding OUT jack. Each OUT jack is wired to a corresponding pair of wires in an *even-numbered* 26-pair receptacle (except SIGNAL 24). One IN MON jack is connected in parallel with each IN jack; OUT MON jacks are connected in parallel only with the first and second IN jack strips at each patch panel.

(2) *Pair 25.* Pair 25 of all 26-pair receptacles is wired to a corresponding PHONE jack. The circuit terminates at the patch panel.

(3) *Pair 26.* Pair 26 of each *odd-numbered* 26-pair receptacle (except SIGNAL 23) is wired to a corresponding INTERCOM jack; each INTERCOM jack is wired through to the INTERCOM jack connected to the corresponding pair of wires in each *even-numbered* 26-pair receptacle (except SIGNAL 24). Pair 26 of SIGNAL 23 and SIGNAL 24 is also wired to a corresponding INTERCOM jack. However, this jack is connected in parallel with each INTERCOM jack at the patch panel.

(4) *Pairs 1 through 24 (SIGNAL 23 and SIGNAL 24).* Pairs 1 through 24 are wired to corresponding MISC jacks. The circuits terminate at the patch panel.

b. Binding Post Circuits.

(1) *Field wire circuits.* Field wire circuits connected at the binding post signal entrance box are wired to corresponding EXTERNAL WIRE LINES 1–12 jacks. The circuits terminate at the patch panel.

(2) *Intershelter telephone circuits.* An intershelter telephone circuit connected at the power and signal entrance box is wired to the parallel-connected TA–312/PT jacks at the patch panel and the PHONE jack in the signal duct.

c. Switchboard Circuits. Connections to the input circuits of the SB–22/PT are wired from the binding post signal entrance box to the binding posts on the switchboard. The SB–22/PT LINES 11-12 jacks are connected in parallel with the corresponding line pairs.

d. Teletypewriter Circuit. The transmitting and receiving circuit of the TT–4A/TG is connected through the TH–5/TG and the 2W–4W switch to the TELETYPE IN–TH–5/TG 4WS–2W4WR jacks. The 4WS–2W4WR jacks are wired directly to correspondingly marked TELETYPE OUT–TH–5/TG jacks.

e. Hybrid Circuits. The 16 hybrid transformers (8 per patch panel A and patch panel B) are wired to correspondingly numbered hybrid jacks 2W, TRANS, and REC. Each hybrid network is used to convert a two-wire circuit into a four-wire circuit and offers matched impedances at both ends of the line.

f. Multiple Circuits. Each of the 16 CONF MULT groups (8 per patch panel A and patch panel C) consists of three jacks connected in parallel.

g. Series Circuits. Each of the 16 CONF SERIES groups consists of three jacks con-

nected in series. When equipment that supplies dc is connected to any one of the jacks in a group, dc of the opposite polarity is available at the other two jacks.

73. Ac Power Circuits

Note. The function of each switch and indicator in the SB–675/MSC is covered in paragraph 29.

a. Ac Power Distribution.

(1) Ac power is applied to the SB–675/MSC through IN POWER 115V AC receptacle J1 in the power and signal entrance box (par. 28). Parallel-connected OUT POWER 115V AC receptacle J2 is provided so that another shelter within the area may be connected to the SB–675/MSC power source, if the rating of the power source is not exceeded.

(2) Ac power from receptacle J1 is applied through the power duct wiring to the MAIN circuit breaker switch CB7 in the power distribution panel. Circuit breakers CB1 through CB6 (parallel-connected) are connected in series with CB7. Wiring to the CONVENIENCE and EQUIPMENT receptacles is distributed through the power duct from circuit breakers CB1 through CB6. Lamp DS7 is connected across the ac input lines to CB7 and lights when power is connected to the SB–675/MSC. Lamps DS1 through DS6 are connected across the circuits controlled by CB1 through CB6, respectively, and light individually as each circuit breaker is operated to ON.

b. Grounding. The SB–675/MSC is grounded (par. 27) to reduce electrical shock hazards. Ground terminals for the SB–675/MSC components are provided adjacent to each ac power receptacle inside the S–189/MSC.

c. Voltmeter M1 and Ammeter M2.

(1) Voltmeter M1 is connected across the ac input circuit after MAIN circuit breaker CB7. It indicates the voltage applied from the power source to the SB–675/MSC.

(2) Ammeter M2 is connected to the ac input circuit through current transformer T1. It indicates the total current being drawn by the operating components of the SB–675/MSC.

CHAPTER 6

SHIPMENT AND LIMITED STORAGE AND DEMOLITION

Section I. SHIPMENT AND LIMITED STORAGE

74. Disassembly of Equipment

Perform the following procedures when the SB–675 MSC is moved to a different location or placed in storage.

a. Operate all ac power switches and circuit breakers to OFF except the LIGHT 1 and LIGHT 2 switches, circuit breaker No. 1 LIGHTS, and the MAIN circuit breaker.

b. Remove the batteries from the SB–22/PT, TA–312/PT's, VOLT-OHM METER and hand lantern for prolonged storage or long-distance shipment.

c. Secure all components in their cases, mountings, or holders.

d. Remove and store all patch cords. Place all miscellaneous items in the storage drawers and cabinets for transit.

e. Disconnect the field wires from the PHONE and INTERCOM binding posts in the power and signal entrance box (fig. 16).

f. Disconnect the 26-pair cables in the connector signal entrance boxes and replace the covers on the receptacles and connectors.

Note. The 26-pair cable is stored in the shelter from which it came.

g. Disconnect the field wires from the binding posts in the binding post signal entrance box (fig. 17). Close and secure the cover.

h. Operate the LIGHT 1 and LIGHT 2 switches, circuit breaker No. 1 LIGHTS, and the MAIN circuit breaker to OFF.

i. If power was obtained from a commercial or central power source, proceed as follows:

(1) At the power source, turn off the circuit breaker (if applicable) and disconnect the shelter power cable.

(2) Disconnect the power cable connector from the power cable stub. Replace both connector covers.

(3) Disconnect the power cable stub from the commercial source and place it in a storage drawer.

j. If power was obtained from an adjacent shelter, disconnect the SB–675/MSC power cable from the OUT POWER 115V AC receptacle at the adjacent shelter. Replace the receptacle and connector covers.

k. Disconnect the power cable from the IN POWER 115V AC receptacle in the power entrance box and replace the cover on the receptacle and the connector.

l. Disconnect the ground strap from the GROUND TERMINAL in the power and signal entrance box. Close and secure the entrance box cover. Place the ground strap in a storage drawer.

m. Close and secure the covers on the exhaust blower vents and air filter.

n. Remove the ground rod and secure it in the shelter.

o. Wind the power cable and the signal cable on the cable reels. Secure the reels to the shelter floor (fig. 13).

p. Recheck the area for loose items. Be sure that all items are properly stored in the shelter.

q. Clean the shelter thoroughly and check to see that the drain plug is firmly in place. Close and lock the shelter door.

75. Transportation

The SB–675/MSC can be transported by truck or by helicopter. Refer to paragraph 26 for lifting, loading, and unloading instructions.

Caution: **When transporting the SB–675/MSC by air, the outside vent covers of the shelter must be opened to equalize the pressure inside and outside the shelter.**

Section II. DEMOLITION OF MATERIAL TO PREVENT ENEMY USE

76. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the commander. The destruction procedure outlined in paragraph 77 will be used to prevent further use of the equipment.

77. Methods of Destruction

Use any or all of the following methods to destroy the equipment.

a. Smash. Smash the controls, tubes, coils, relays, switches, capacitors, transformers, and meters; use sledges, axes, handaxes, pickaxes, hammers, or crowbars.

b. Cut. Cut all cables and cords and slash the wiring on the components; use axes, handaxes, or machetes.

c. Burn. Burn cords and technical manuals; use gasoline, kerosene, oil, flamethrowers, or incendiary grenades.

d. Bend. Bend panels and cabinets.

e. Explode. If explosives are necessary, use firearms, grenades, or TNT.

f. Dispose. Bury or scatter the destroyed parts in slit trenches, foxholes, or throw them into streams.

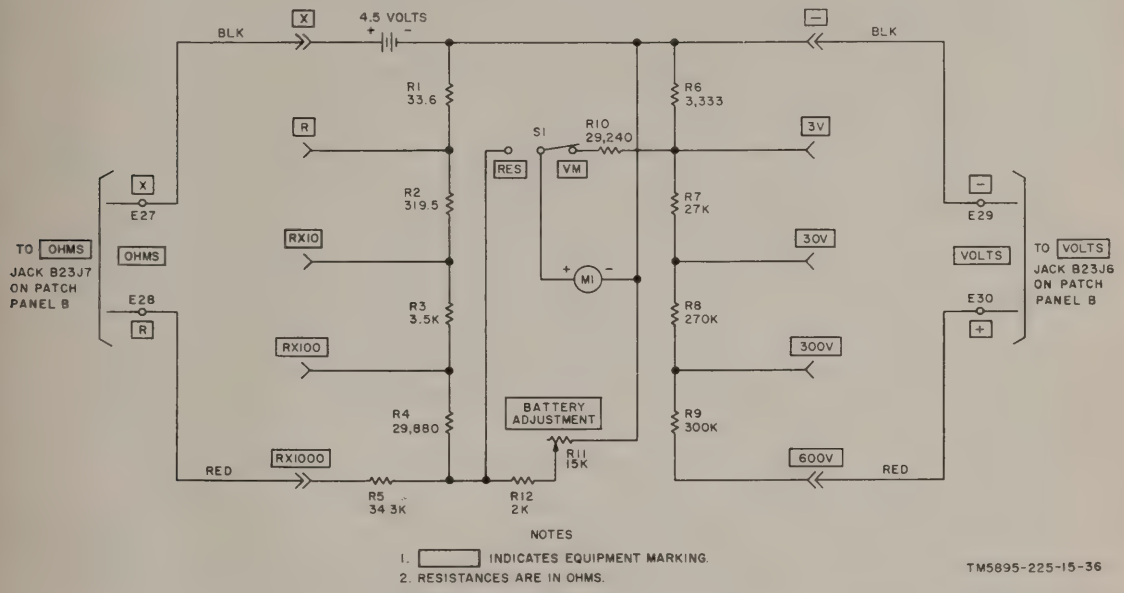


Figure 54. Voltohmmeter, schematic-wiring diagram.

Figure 55. Panel, Patching, Communication SB–675/MSC, signal schematic-wiring diagram.
(Located in back of manual)

APPENDIX I

REFERENCES

The following references are applicable for the operator and repairmen of Radio Terminal Set AN/MRC–73:

AR 320–5	Dictionary of United States Army Terms.
AR 320–50	Authorized Abbreviations.
AR 700–38	Unsatisfactory Equipment Reports (Reports Control System CSGID–247(R2)).
FM 21–5	Military Training.
FM 21–6	Techniques of Military Instruction.
FM 21–30	Military Symbols.
DA Pam 108–1	Index of Army Motion Pictures, Television Recordings, and Filmstrips.
DA Pam 310-series	Military Publications Indexes (as applicable).
TB SIG 203	Installation, Adjustment and Maintenance of Interupter PE–250 and Static Ringing Generators TA–248/TT and TA–248A/TT.
TM 11–2096	Test Set TS–140/PCM; Signal Generators SG–15/PCM and SG–15A/PCM; and Decibel Meters ME–22/PCM and ME–22A/PCM.
TM 11–2138	Terminal Box TA–125/GT; Telephone Repeating Coil Assembly TA–145/GT; Maintenance Kit MX–842/GT; and Switchboard Signal TA–123/GT.
TM 11–2202	Manual Telephone Switchboards SB–22/PT and SB–22A/PT.
TM 11–2155	Telephone Set TA–312/PT.
TM 11–5805–201–12P	Operator and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Telephone Set TA–312/PT.
TM 11–5805–246–10	Operator's Manual: Terminal, Telegraph TH–5/TG.
TM 11–5805–246–12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Terminal Telegraph TH–5/TG.
TM 11–5805–246–20	Organizational Maintenance Manual, Terminal, Telegraph TH–5/TG.
TM 11–5805–257–12P	Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Generators, Ringing Hand G–42/PT and G–42A/PT.
TM 11–5815–206–12	Operator's and Organizational Maintenance: Teletypewriter Set AN/PGC–1 and Teletypewriters TT–4A/TG and TT–4B/TG.
TM 11–5830–221–12	Operator's and Organizational Maintenance Manual: Intercommunication Station LS–147B/FI.
TM 11–5935–204–15P	Operator, Organizational, Field and Depot Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Connector, Plug, Electrical, U–185A/G.
TM 11–5935–205–15P	Operator, Organizational, Field and Depot Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Connector, Receptacle, Electrical U–187/G.

TM 11–5965–224–12P	Operator and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart: Handsets H–60/PT and H–165/U.
TM 11–6625–203–12	Operation and Organizational Maintenance: Multimeter AN/URM–105, including Multimeter ME–77/U.
TM 11–6625–203–12P	Operator's and Organizational Repair Parts and Special Tools List for Multimeter AN/URM–105.
TM 11–6625–203–35	Field and Depot Maintenance: Multimeter AN/URM–105, including Multimeter ME–77/U.
TM 11–6625–203–35P	Field and Depot Repair Parts and Special Tools List for Multimeter AN/URM–105.

APPENDIX II

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

a. This appendix assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon. It also specifies the tools and other equipment authorized at each echelon to perform the assigned maintenance functions.

b. Columns in the maintenance allocation chart are as follow:

(1) *Part or component.* This column shows only the nomenclature or standard item name. Additional descriptive data are included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically. Assemblies and subassemblies are in alphabetical sequence with their components listed alphabetically immediately below the assembly listing.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operations.

(*a*) *Service.* To clean, to preserve, and to replenish fuel and lubricants.

(*b*) *Inspect.* To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(*c*) *Test.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(*d*) *Replace.* To substitute serviceable assemblies, subassemblies and parts for unserviceable components.

(*e*) *Rebuild.* To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications and subsequent reassembly of the item.

(3) *1st, 2d, 3d, 4th, and 5th echelon.* The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* This column is used to clarify any of the data cited in the preceding columns.

c. Columns in section III, allocation of tools for maintenance functions, are as follow:

(1) *Tools required for maintenance functions.* This column lists tools test, and maintenance equipment required to perform the maintenance functions.

(2) *1st, 2d, 3d, 4th, 5th echelon.* A dagger (†) indicates the echelons allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

(4) *Remarks.* This column is used to clarify data in the other columns.

2. Maintenance by Using Organizations

When this equipment is used by Signal service organizations organic to theater head-

quarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

3. Mounting Hardware

The basic entries of the maintenance allocation chart do not include mounting hardware such as screws, nuts, bolts, washers, brackets, clamps, etc.

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH	(6) 4TH ECH	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
COMMUNICATIONS PATCHING PANEL SB 675 MSC	service	X						Interior
			X					Exterior
	inspect		X				3, 4	Interior and Exterior
	test		X				1	Continuity (Shelter signal and power ckts)
	rebuild					X		
SHELTER, ELECTRICAL EQUIPMENT S 189 MSC	rebuild					X	3, 4	
BRACKETS AND BRACKET ASSEMBLIES	replace				X			Fabricate
CABLE ASSEMBLIES	replace		X					
CABLE	replace		X				3, 4	
CONNECTORS	replace		X				3, 4	See Separate MAC for U-185 G Connector
REEL, CABLE	replace		X					
CLOCK	replace		X				3	
CONDUIT ASSEMBLIES								
BALLAST, LAMP	replace		X				3	
CONNECTORS, RECEPTACLE, ELECTRICAL	replace		X				3, 4	
FILTERS, RADIO INTERFERENCE	replace		X				3	
JACKS, TELEPHONE	replace		X				3	
LAMPHOLDERS	replace		X				3	
LAMPS	replace	X						
POSTS, BINDING	replace		X				3	
CAPS, NEOPRENE	replace		X					
SHIELD, ELECTRIC LIGHT	replace		X					
STARTERS, LAMP, FLUORESCENT	replace	X						
SWITCHES	replace		X				3	
CURTAINS, BLACKOUT	replace		X				3	
FANS, VENTILATING								
CABLE, ELECTRICAL	replace		X				3	
CAPACITORS	replace		X				3	
CLAMP, CAPACITOR	replace				X			Fabricate
GASKETS	replace				X			Fabricate
HOODS, FAN	replace				X			Fabricate
IMPELLER, FAN	replace		X				3	
MOTOR, A.C.	replace		X				3	
HEATER, SPACE, ELECTRICAL								
CABLE, POWER, ELECTRICAL	replace		X				3	
CONNECTORS	replace		X				3	

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH	(6) 4TH ECH	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
SB 675 MSC (continued)								
GRID, HEATING ELEMENT	replace		X				3	
IMPELLER, FAN	replace		X				3	
MOTOR, ALTERNATING CURRENT	replace		X				3	
SWITCHES	replace		X				3	
JACK FRAME ASSEMBLIES								
JACK STRIP ASSEMBLY								
JACKS, TELEPHONE	replace		X				3	
STRIP, JACK	replace				X			Fabricate
LANTERN, ELECTRIC								
BATTERIES, DRY	replace	X						
LAMP, INCANDESCENT	replace	X						
LIGHT, EXTENSION								
LAMP, INCANDESCENT	replace	X						
PANEL, POWER DISTRIBUTION								
BUS BAR	replace				X			Fabricate
CIRCUIT BREAKERS	replace		X				3	
LAMPS, GLOW	replace	X						
LAMPHOLDERS	replace		X				3	
METERS	replace		X				3	
TRANSFORMER	replace		X				3	
PANELS, SIGNAL AND POWER ENTRANCE								
CONNECTORS	replace		X				3,4	See Separate MAC for U-187/G Connectors
GASKETS	replace				X			Fabricate
POSTS, BINDING	replace		X				3	
CAPS, NEOPRENE	replace		X					

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH	(6) 4TH ECH	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
SB 675 MSC (continued)								
PLATE ASSEMBLY, TIE DOWN	replace		X				3	
SHELTER								
DOOR ASSEMBLIES	replace			X				
FILTERS, AIR CONDITIONING	replace		X				3	
FRAME, AIR FILTER	replace				X			Fabricate
GASKETS	replace			X			3	
GUARD, AIR FILTER	replace				X			Fabricate
HANDLES, DOOR	replace		X				3	
HINGE ASSEMBLIES	replace		X				3	
LATCH, DOOR	replace		X				3	
LOUVER ASSEMBLIES	replace			X			3	
PANELS, DUTCH DOOR	replace				X		3	
EYE BOLT	replace		X				3	
LIFTS, TIE EYE	replace			X			3	
MOLDINGS	replace				X		3	
PLUG, DRAIN	replace		X				3	
SKIDS	replace				X		3	
STEPS, FOLDING	replace		X				3	
STRAP, TIE DOWN ASSEMBLY	replace		X				3	
TABLE TOP ASSEMBLIES	replace				X			Fabricate

SECTION III ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH	(3) 2ND ECH	(4) 3RD ECH	(5) 4TH ECH	(6) 5TH ECH	(7) TOOL CODE	(8) REMARKS
SB 675 MSC (continued)							
MULTIMETER AN URM 105		†				1	
MULTIMETER TS 352 U			†	†	†	2	
TOOL KIT, GENERAL MECHANICS		†	†	†	†	3	
SOLDERING IRON TL 117		†	†	†	†	4	

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Installation test	23	25
Interconnection	17	24
Removal and replacement	55	48
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Connection	19	24
Description	9*d*	15
Installation	14*d*	22
Removal and replacement	54	48
Teletypewriter TT–4A/TG:		
Description	9*e*	15
Installation	14*c*	21
Installation test	23	25
Interconnection	18	24
Removal and replacement	56	48
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Description	9*g*	15
Installation	14*e*	23

	Paragraph	Page
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Interconnection	20	24
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Ac power	73	61
General	71	61
Signal circuits	72	60
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Connections	33	34
Description	10*i*(3)	18
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Theory	73	61
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Description	10*j*	19
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BY ORDER OF THE SECRETARY OF THE ARMY:

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Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

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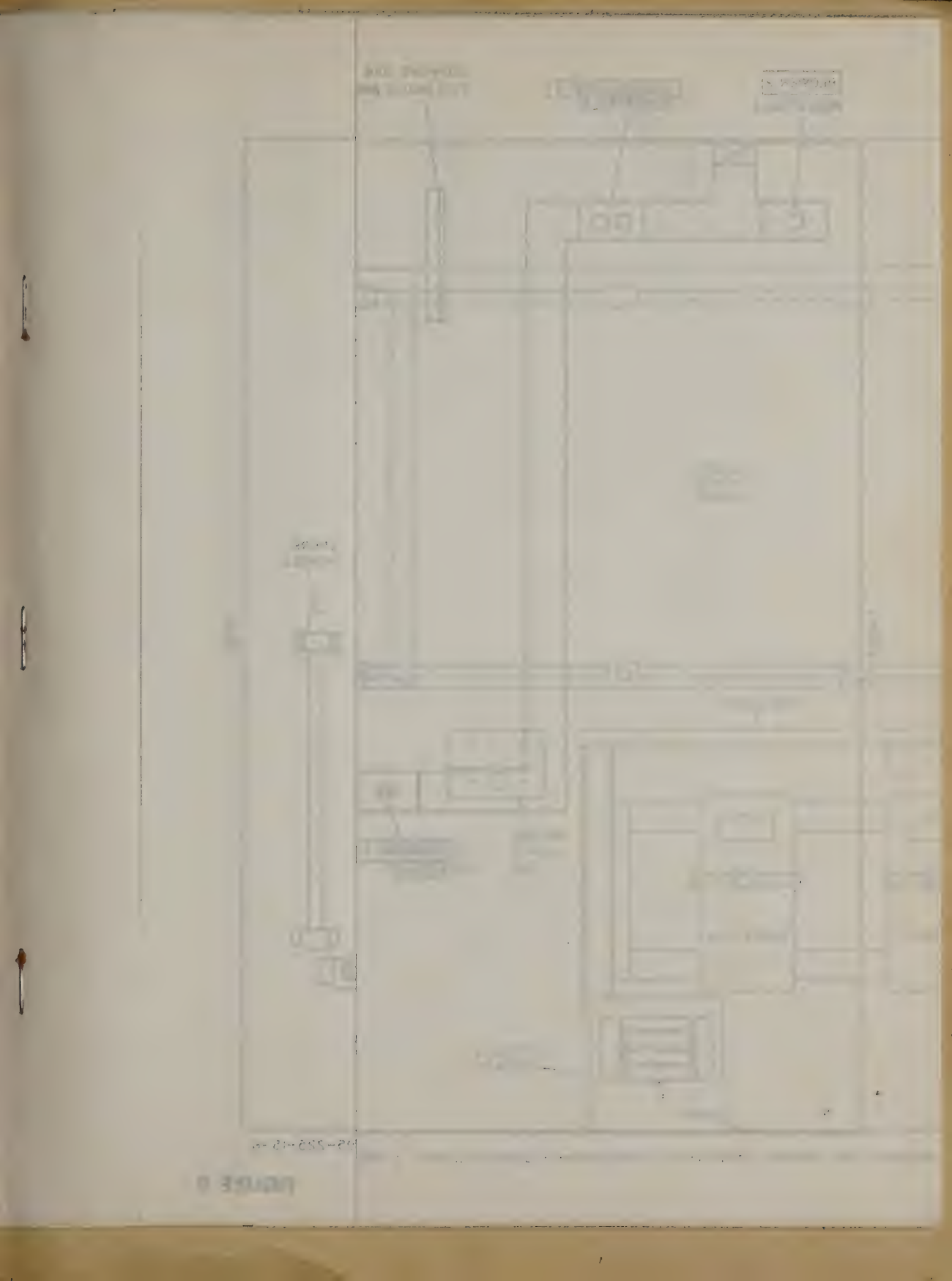


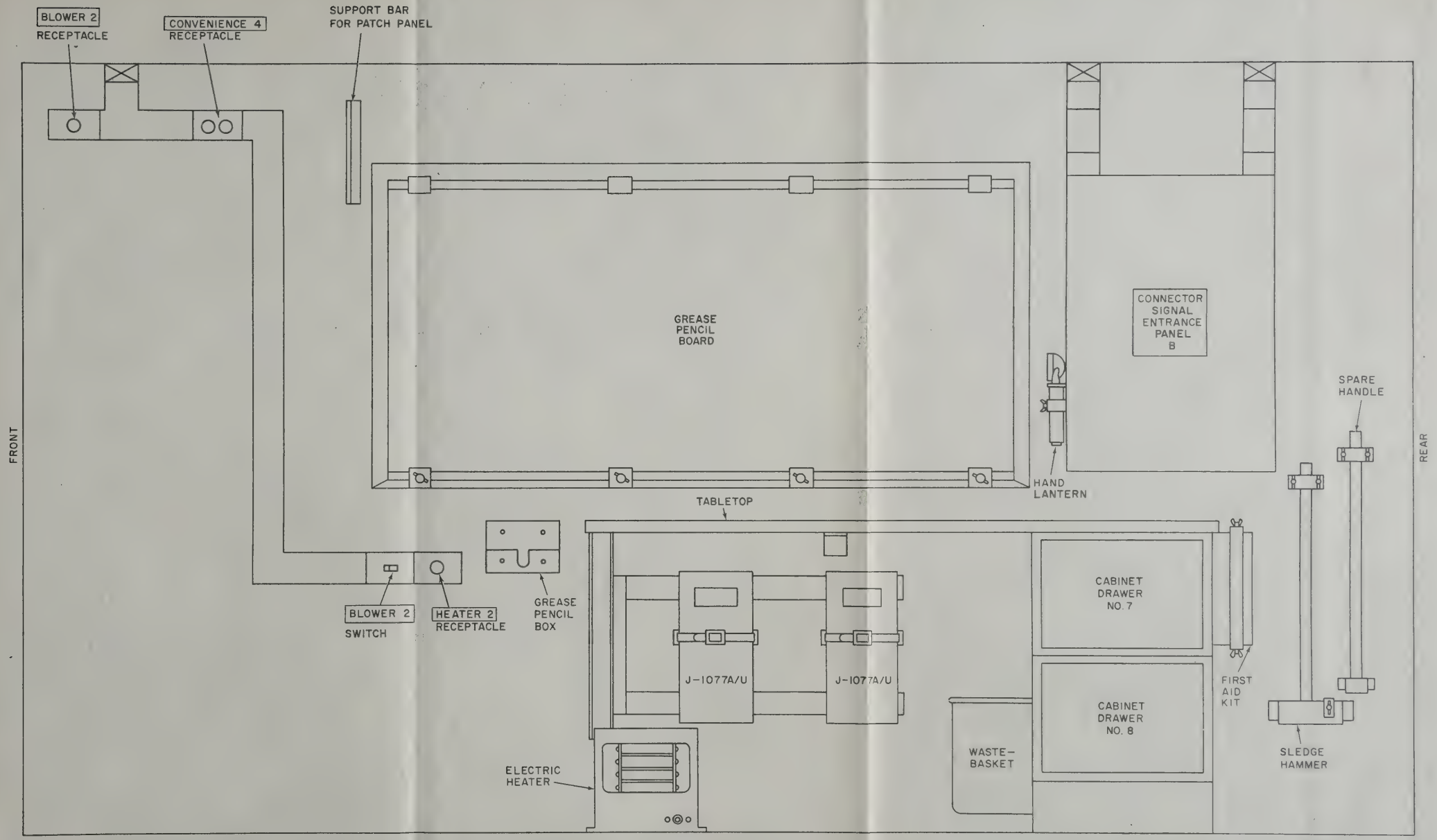


Figure 9. Panel, Patching, Communication SB-675/MSC, curbside wall, elevation diagram.

FIGURE 9

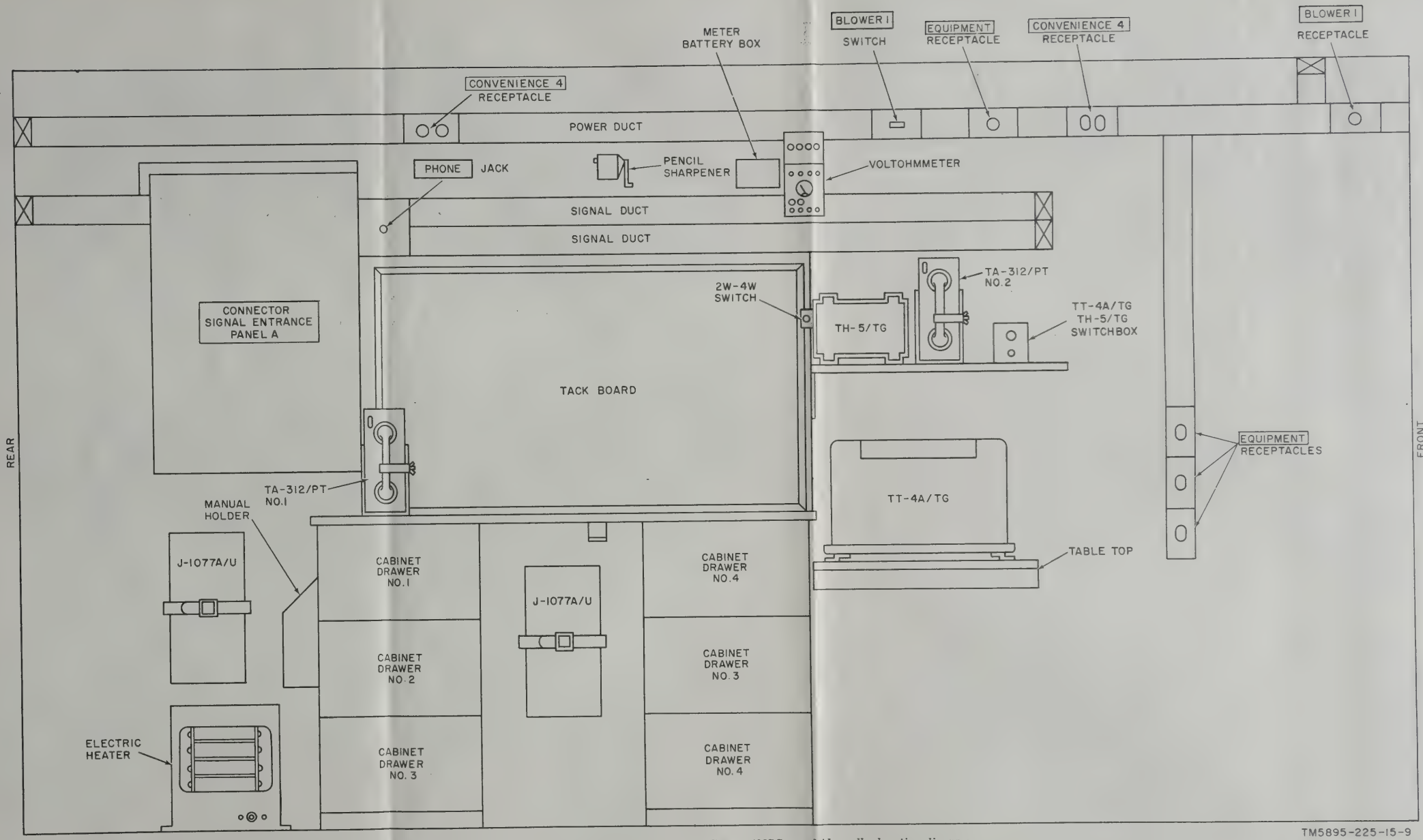


Figure 10. Panel, Patching, Communication SB–675/MSC, roadside wall, elevation diagram.

FIGURE 10

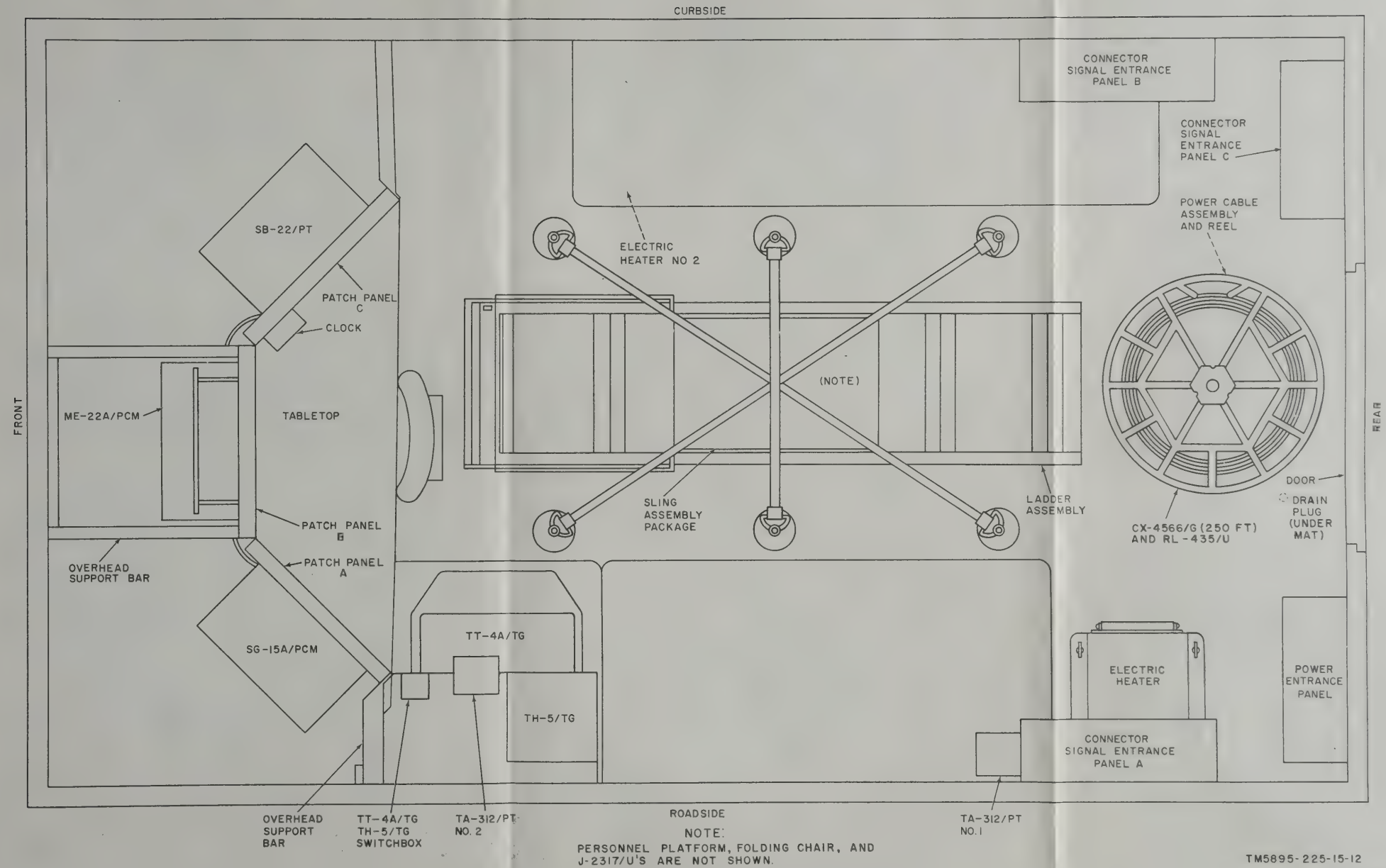


Figure 13. Panel, Patching, Communication SB-675/MSC, floor plan.

FIGURE 13

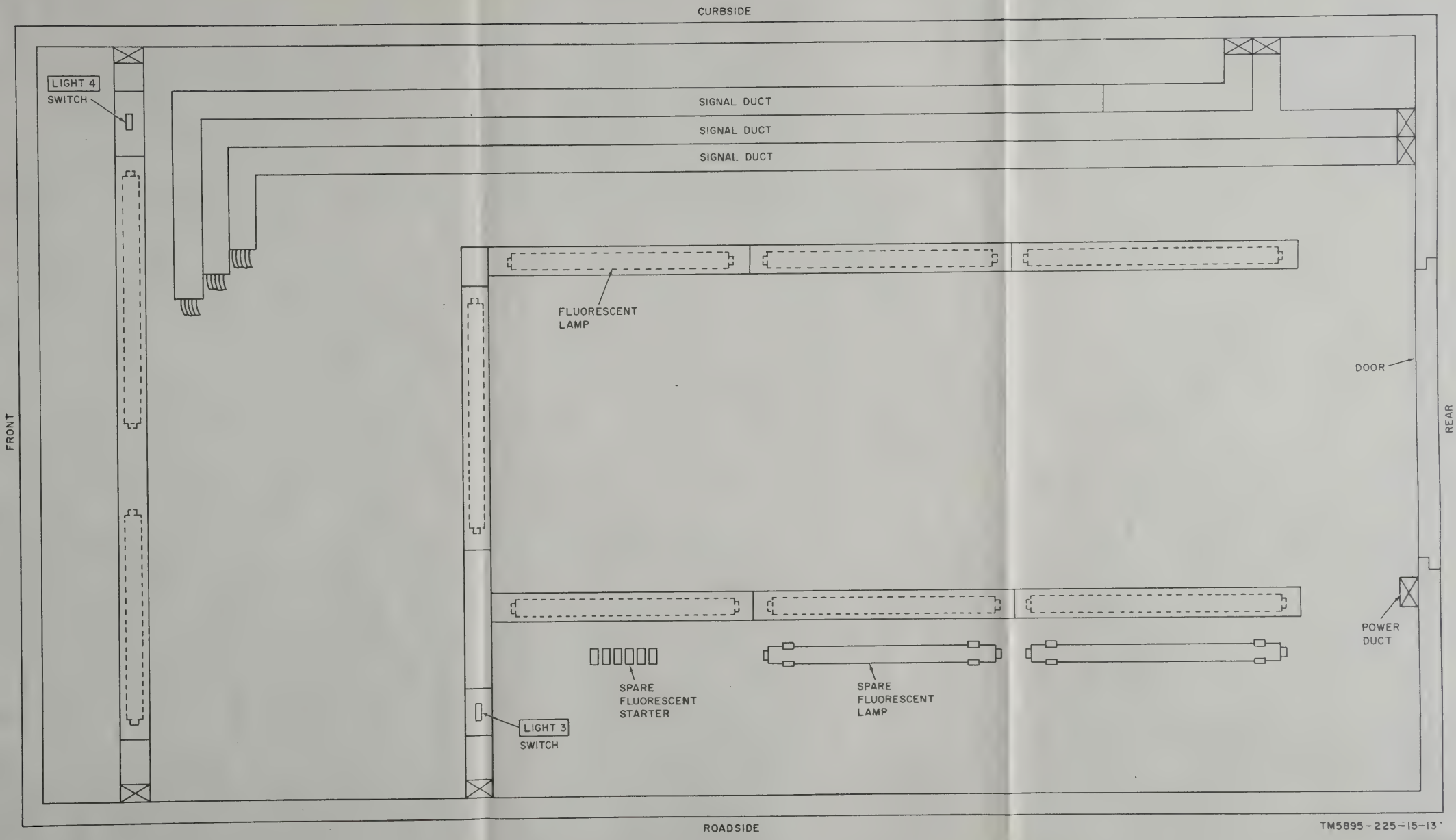


Figure 14. Panel, Patching, Communication SB-675/MSC, ceiling plan.

FIGURE 14

FIGURE 18

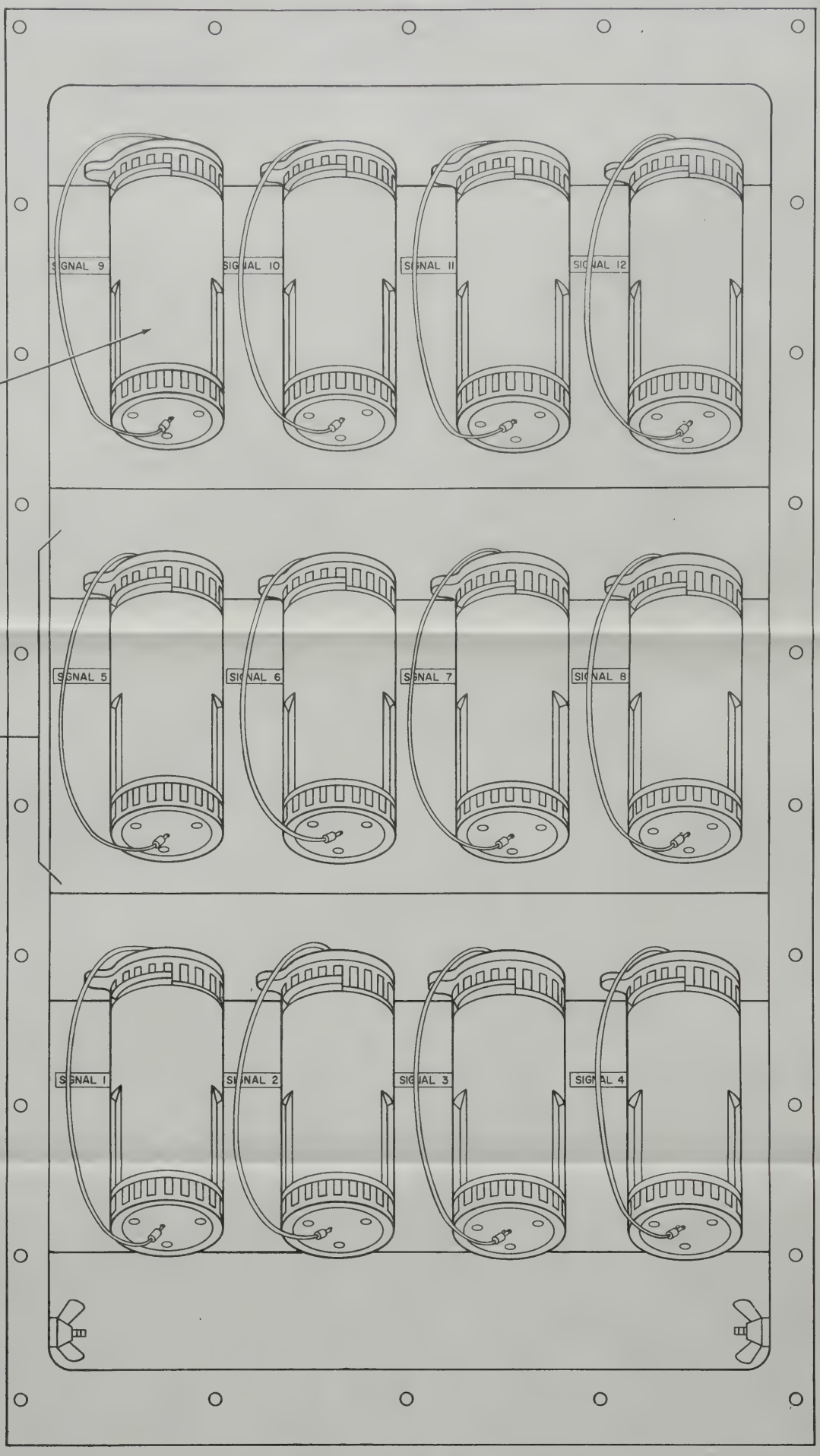


Figure 18. Connector signal entrance box A, cover removed.

NOTE:
CONNECTOR SIGNAL ENTRANCE BOX B (SIGNAL 13 THROUGH SIGNAL 24) IS THE SAME AS CONNECTOR SIGNAL ENTRANCE BOX A EXCEPT FOR THE NUMBER ASSIGNED TO EACH 26-PAIR RECEPTACLE.

TM5895-225-15-16

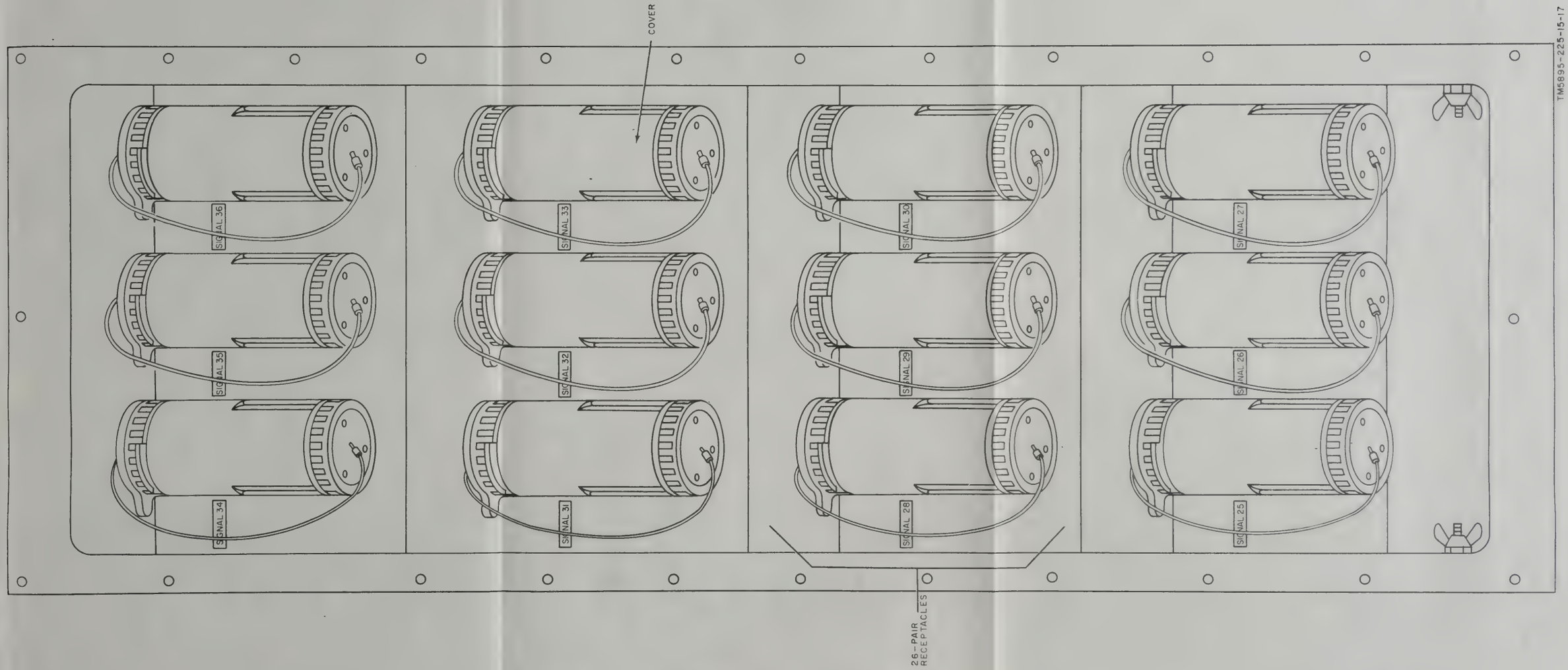
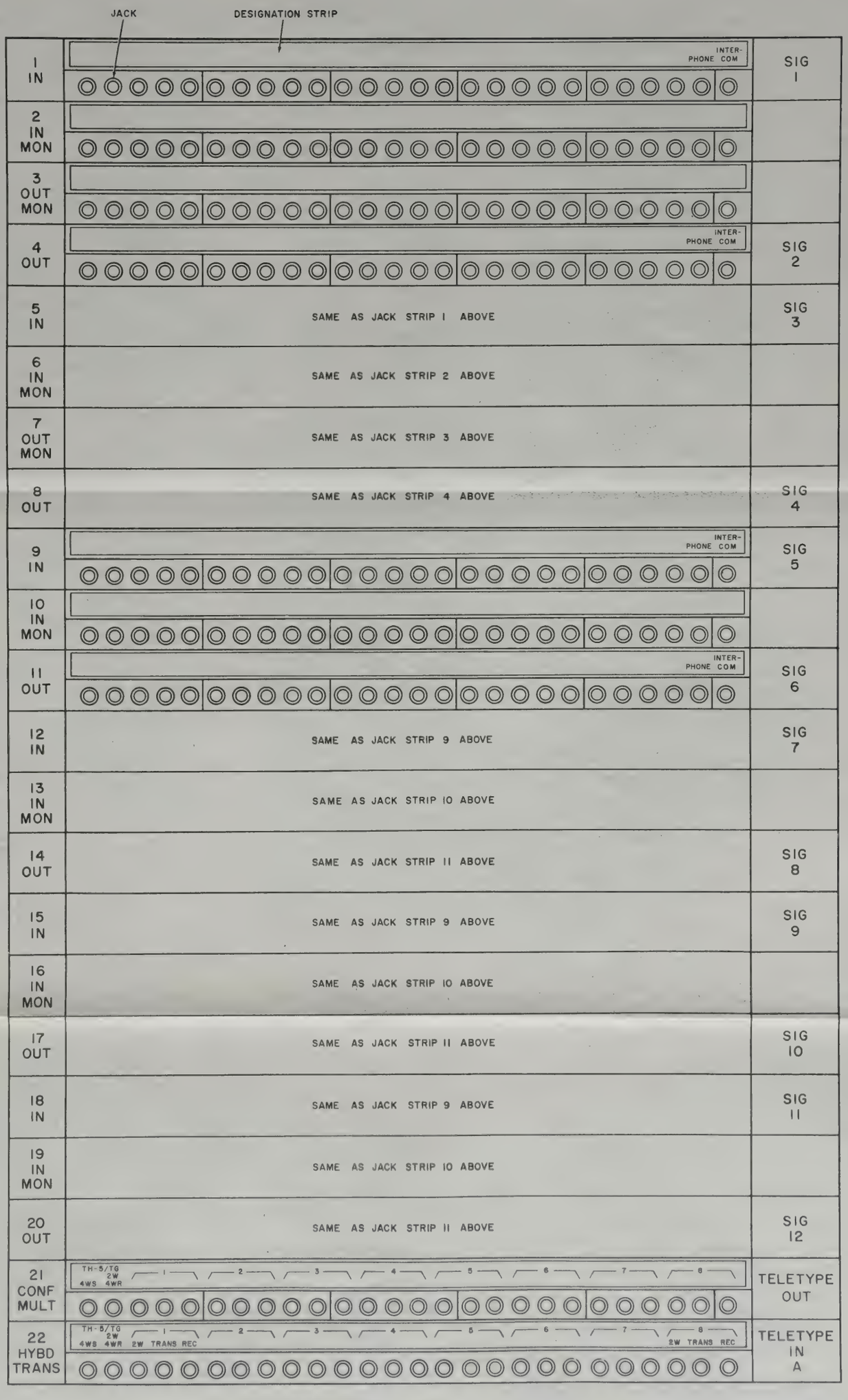


Figure 19. Connector signal entrance box C, cover removed.

FIGURE 19

SAME AS BACK STRIP 3 ABOVE



A. PANEL LOCATED ABOVE THE TABLETOP

B. JACK STRIP LOCATED BELOW THE TABLETOP

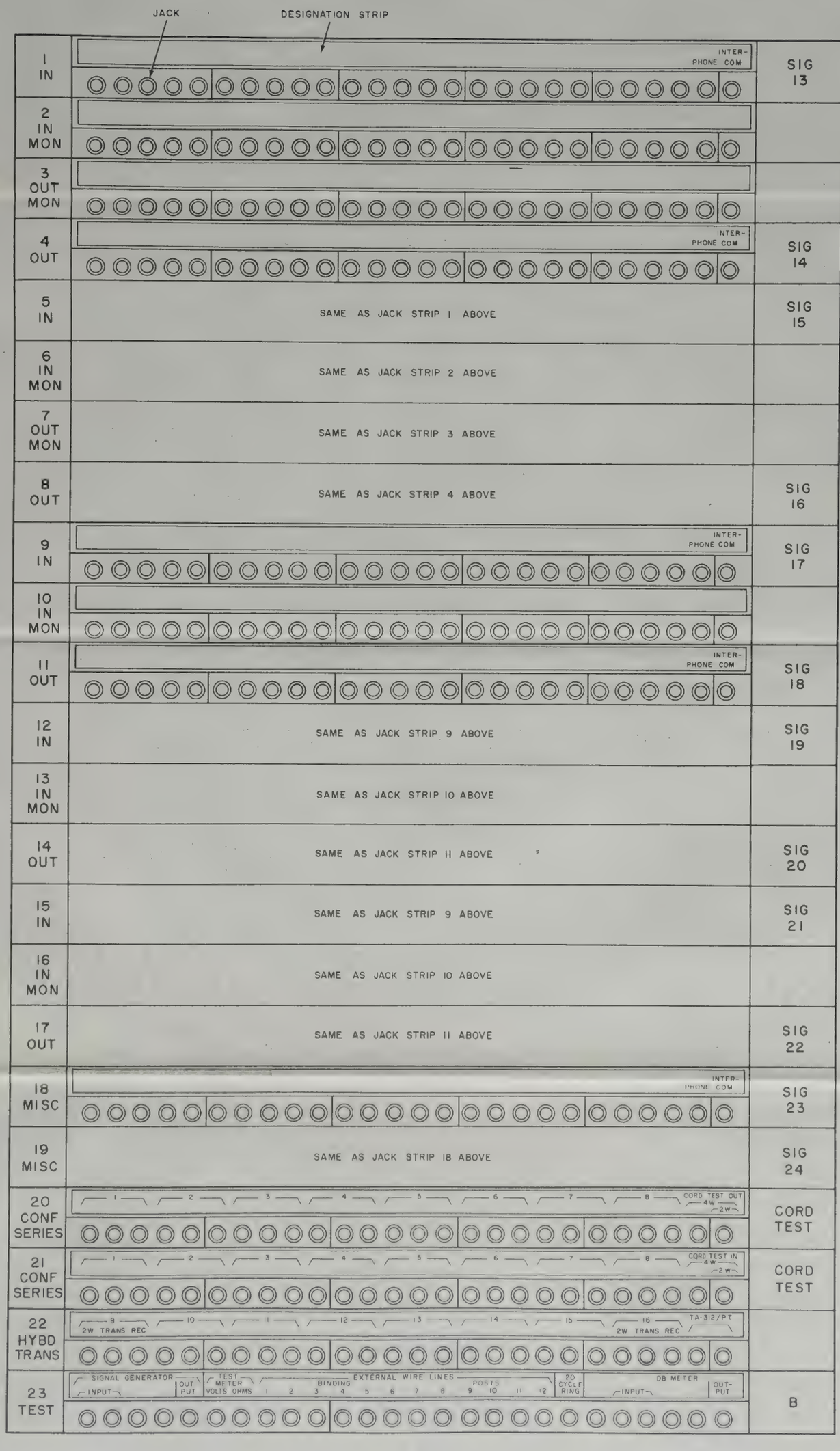
TM5895-225-15-21

Figure 23. Patch panel A.

FIGURE 23

8" TANK SIDE POCKET BEAM AT MOMENT SLAB

ADDED BY



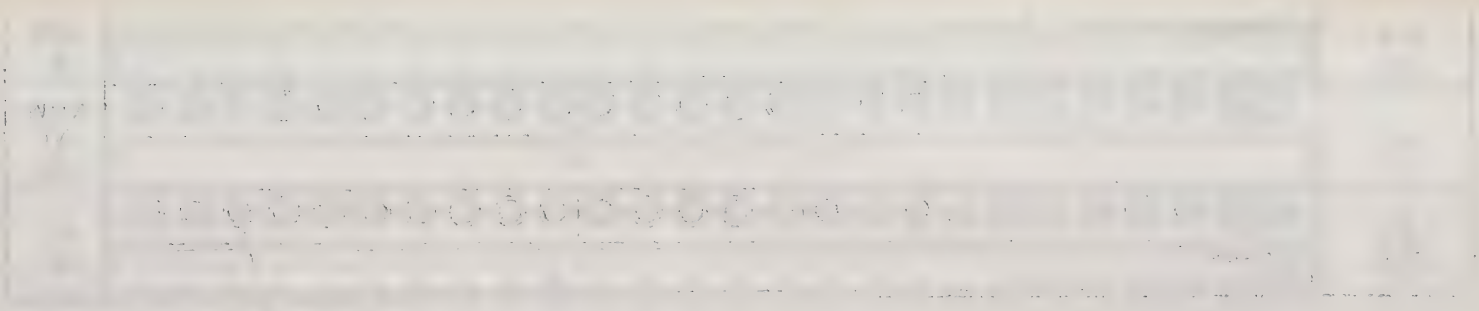
A. PANEL LOCATED ABOVE THE TABLETOP

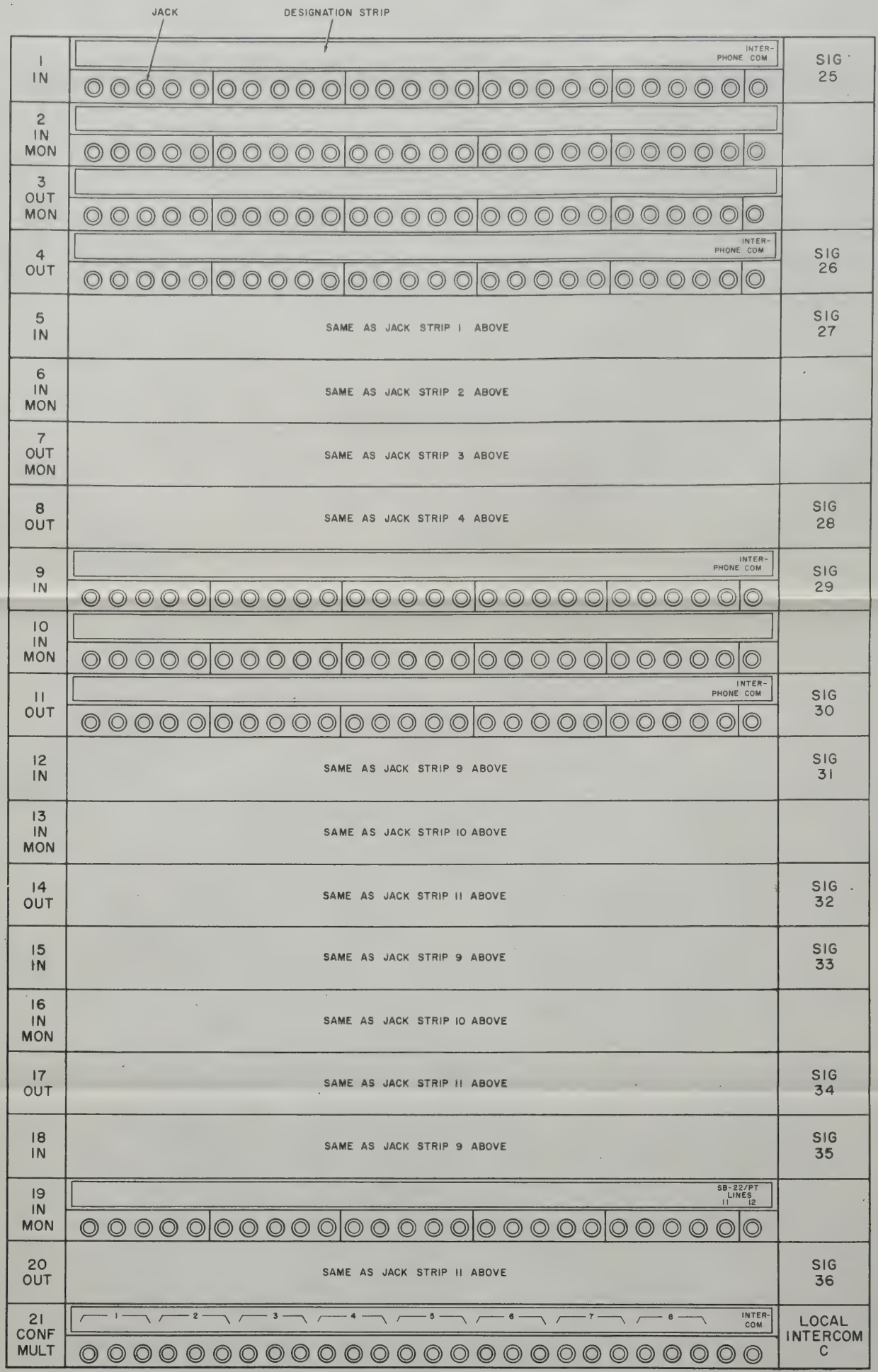
B. JACK STRIP LOCATED BELOW THE TABLETOP

TM5895-225-15-22

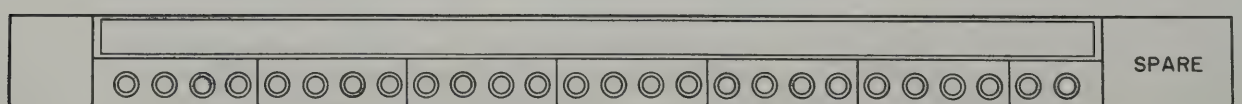
Figure 24. Patch panel B.

FIGURE 24



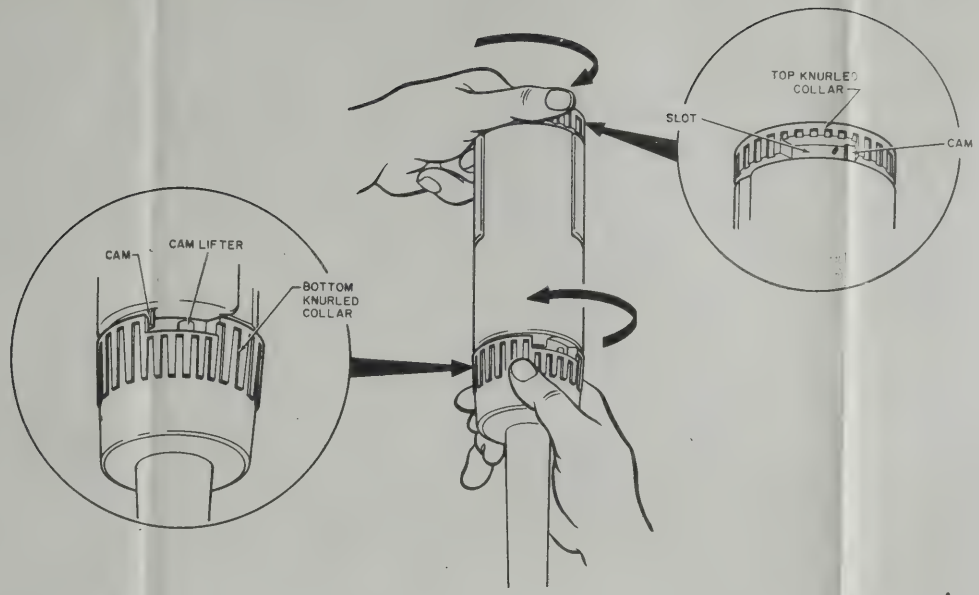


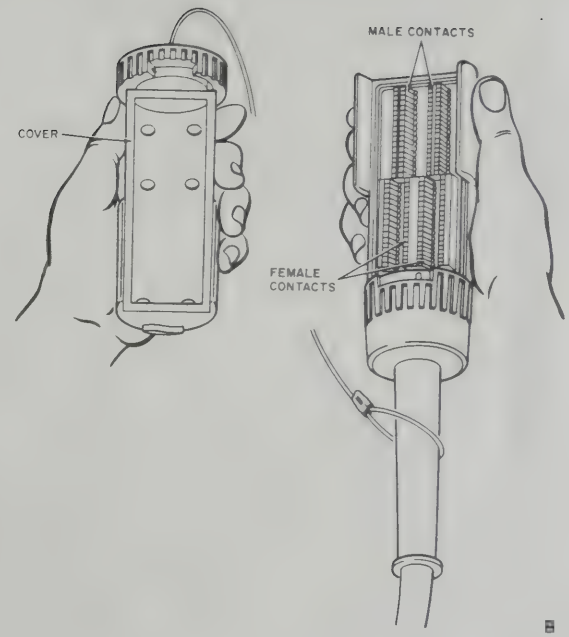
A. PANEL LOCATED ABOVE THE TABLETOP

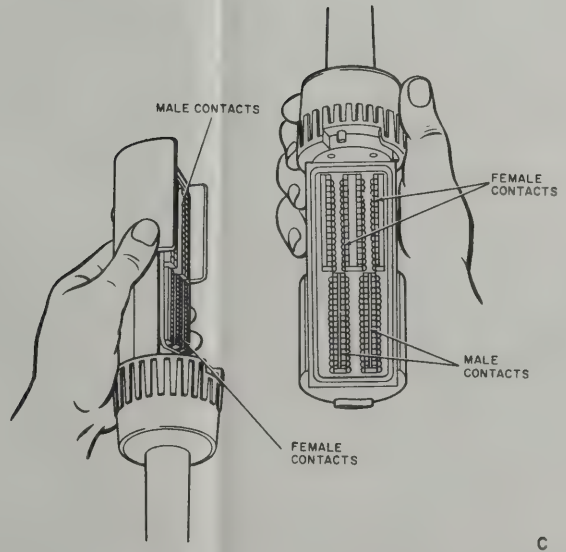


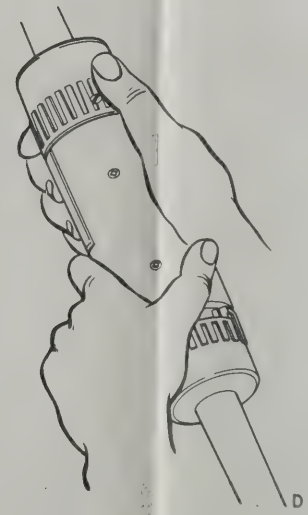
B. JACK STRIP LOCATED BELOW THE TABLETOP

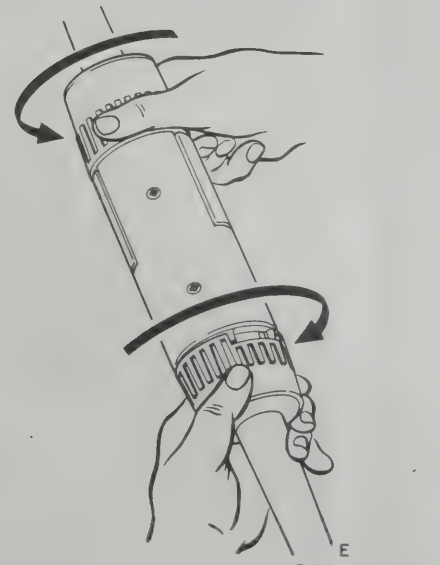
Figure 25. Patch panel C.











TM5805-285-15-28

Figure 34. Coupling 26-pair connectors.

FIGURE 34

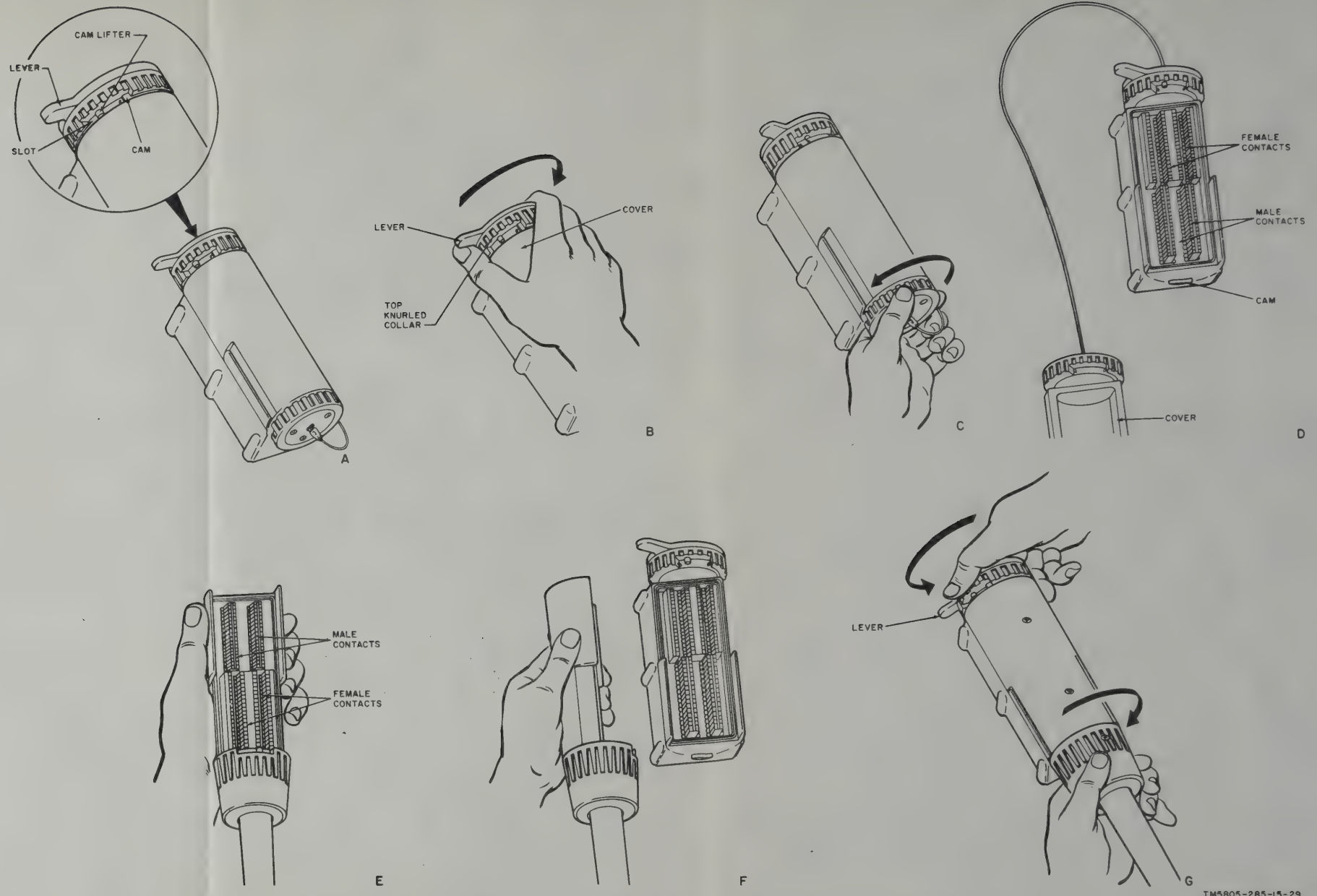
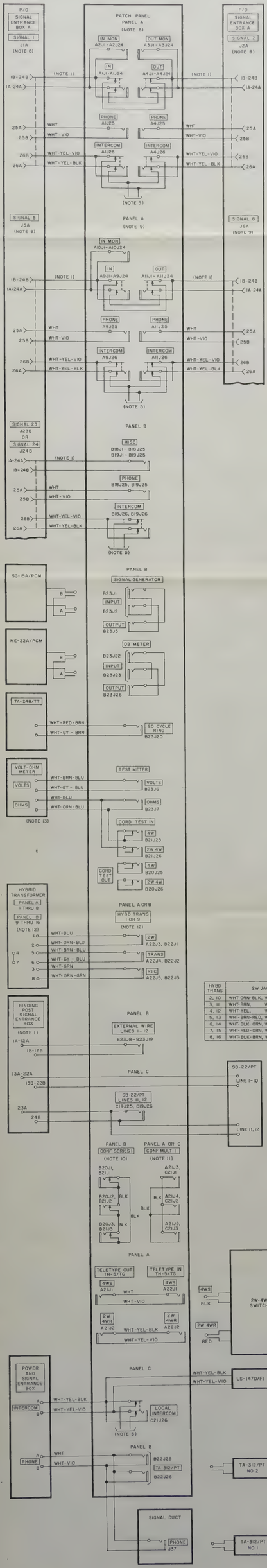


Figure 35. Connecting 26-pair connector to 26-pair receptacle.

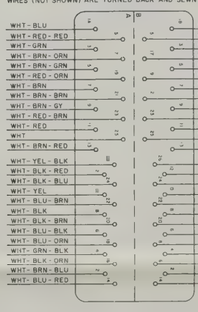
FIGURE 35

FIGURE 55

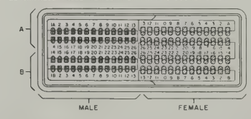


NOTES:

1. 26-PAIR RECEPTACLE AS SEEN FROM WIRING SIDE. BLUE AND RED WIRES (NOT SHOWN) ARE TURNED BACK AND SEWN INTO FORM.



2. ▭ INDICATES EQUIPMENT MARKING.
3. ALL WIRING IS 24 GAGE UNLESS OTHERWISE INDICATED.
4. ONLY FEMALE ⟩——⟨ CONTACTS OF 26-PAIR CONNECTOR ARE SHOWN. EACH FEMALE CONTACT IS CONNECTED IN PARALLEL WITH A MALE CONTACT ⟩——⟨
5. INTERCOM JACKS (26TH PAIR) SIGNAL 1 THRU SIGNAL 36 ARE WIRED IN PARALLEL.
6. 26-PAIR RECEPTACLE VIEWED FROM PIN AND SOCKET SIDE:



7. REFERENCE SYMBOLS FOR ALL JACKS IN THE PATCH PANEL ARE DESIGNATED BY PANEL, JACK STRIP, AND JACK NUMBER. JACK A2J1 IS LOCATED IN PANEL A, JACK STRIP 2, AND IT IS THE FIRST JACK, COUNTED FROM LEFT TO RIGHT WHEN FACING THE PANEL.
8. SIGNAL 1 AND SIGNAL 2 ARE SHOWN. THE IDENTICAL SIGNAL ENTRANCE BOX, SIGNAL CONNECTOR, AND PATCH PANEL DESIGNATIONS ARE SHOWN IN THE CHART BELOW.

SIGNAL ENTRANCE BOX	SIGNAL CONNECTOR		PATCH PANEL	
	NO.	REF DESIG	DESIG	STRIP NO.
A	1-4	J1A-J4A	A	1, 4, 5, 8
B	13-16	J13B-J16B	B	1, 4, 5, 8
C	25-28	J25C-J28C	C	1, 4, 5, 8

9. SIGNAL 5 AND SIGNAL 6 ARE SHOWN. THE IDENTICAL SIGNAL ENTRANCE BOX, SIGNAL CONNECTOR, AND PATCH PANEL DESIGNATIONS ARE SHOWN IN THE CHART BELOW.

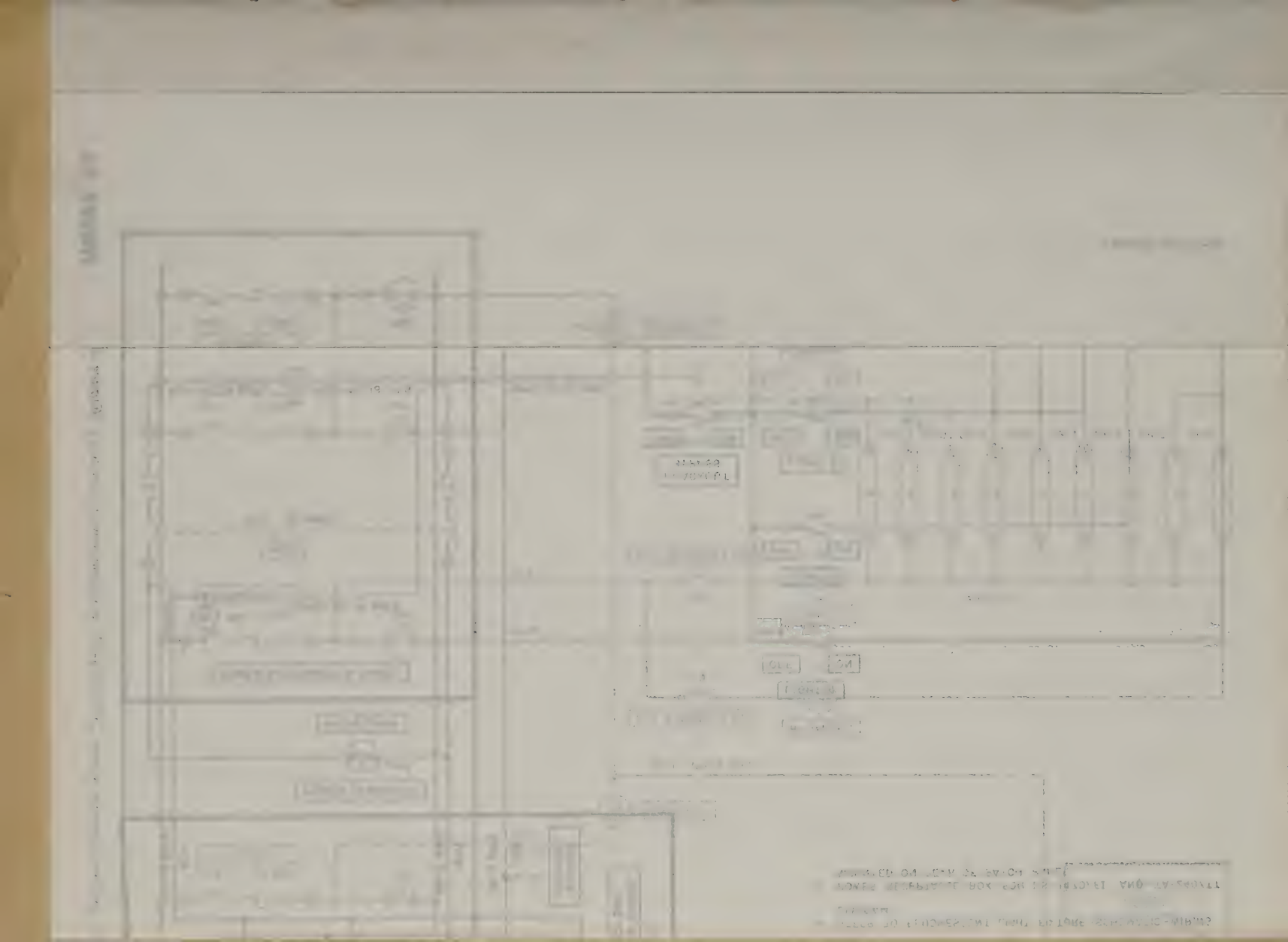
SIGNAL ENTRANCE BOX	SIGNAL CONNECTOR		PATCH PANEL	
	NO	REF DESIG	DESIG	STRIP NO.
A	5-8	J5A-J8A	A	9, 11, 12, 14
A	9-12	J9A-J12A	A	15, 17, 18, 20
B	17-19	J17B-J19B	B	9, 11, 12
B	20-22	J20B-J22B	B	14, 15, 17
C	29-32	J29C-J32C	C	9, 11, 12, 14
C	33-36	J33C-J36C	C	15, 17, 18, 20

10. CONF SERIES I ON PANEL B IS SHOWN. CONF SERIES 2 THRU 8 ARE IDENTICAL EXCEPT FOR THE JACK DESIGNATIONS WHICH CONTINUE IN THE SAME SEQUENCE TO B20J24 AND B21J24 RESPECTIVELY.
11. CONF MULT I ON PANEL A OR C IS SHOWN. CONF MULT 2 THRU 8 ARE IDENTICAL EXCEPT FOR THE JACK DESIGNATIONS WHICH CONTINUE IN THE SAME SEQUENCE TO A2J26 AND C2J24 RESPECTIVELY.
12. HYBD TRANS I ON PANEL A, AND 9 ON PANEL B ARE SHOWN. HYBD TRANS 2 THRU 8 AND 10 THRU 16 ARE IDENTICAL EXCEPT FOR THE JACK DESIGNATIONS WHICH CONTINUE IN THE SAME SEQUENCE TO A22J26 AND C22J24 RESPECTIVELY. WIRING FOR HYBD TRANS 1 IS SHOWN. WIRING FOR OTHER JACKS IS SHOWN BELOW.

HYBD TRANS	2W JACK	TRANS JACK	REC JACK
2, 10	WHT-GRN-BLK, WHT-YEL-GRN	WHT-BRN-GRN, WHT-GY-GRN	WHT-BLU-BLK, WHT-YEL-BLU
3, 11	WHT-BRN, WHT-GRN	WHT-BLK, WHT-ORN	WHT-BRN-GY, WHT-BRN-VIO
4, 12	WHT-YEL, WHT-BLU-GRN	WHT-RED, WHT-GY	WHT-BLK-RED, WHT-ORN-RED
5, 13	WHT-BRN-RED, WHT-GRN-RED	WHT-BLU-RED, WHT-YEL-RED	WHT-RED-RED, WHT-GY - RED
6, 14	WHT-BLK-ORN, WHT-ORN-ORN	WHT-BRN-ORN, WHT-ORN-ORN	WHT-BLK-ORN, WHT-YEL-ORN
7, 15	WHT-RED-ORN, WHT-GY-ORN	WHT-BLK-BRN, WHT-ORN-BRN	WHT-BRN-BRN, WHT-GRN-BRN
8, 16	WHT-BLK-BRN, WHT-YEL-BRN	WHT-RED-BRN, WHT-GY-BRN	WHT-BLK, WHT-ORN-BLU

13 REFER TO VOLT-OHM METER SCHEMATIC-WIRING DIAGRAM

Figure 55. Panel, Patching, Communication SB-675/MSC, signal schematic-wiring diagram.



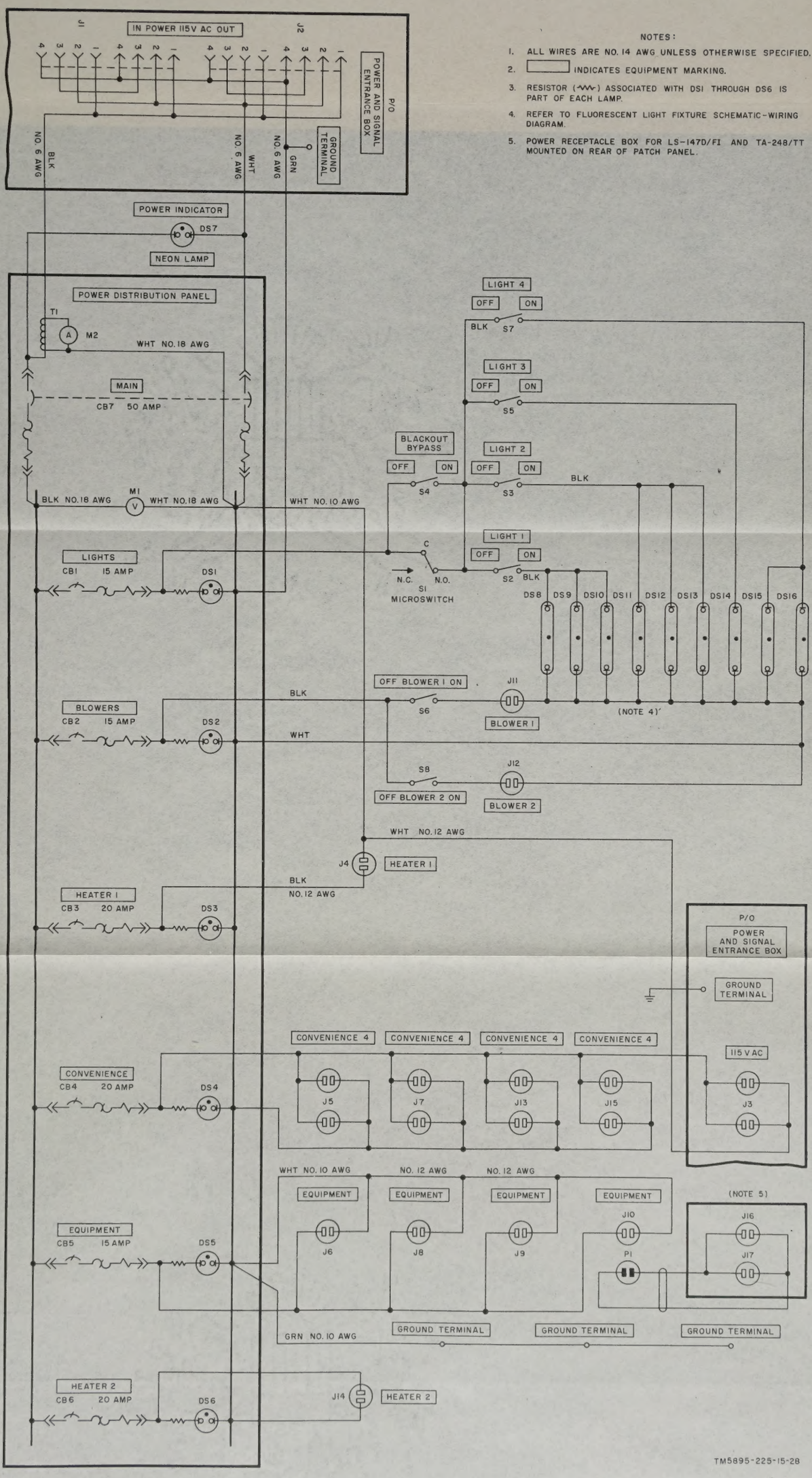


FIGURE 56

Figure 56. Panel, Patching, Communication SB-675/MSC, power schematic-wiring diagram.